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The New England Surgical Society.

PRESIDENTIAL ADDRESS.

SOME CHANGES IN MEDICAL TEACHING AND SURGERY.*

By C. A. PORTER, M.D., BOSTON.

THE custom of having an annual presidential address, before such societies as ours, must occasionally result in much suffering to its members. To-night, therefore, the address will be short, for I shall only give my personal experience, with a few of the surgical changes which have taken place since men of my age graduated.

I want to call your attention to certain tendencies, now showing themselves, all, of course, marking progress, though at times this may seem to be sideways, if not backwards. It is hard, even for those of us who are in close contact with surgical teaching, to realize how much more knowledge is required of the student now than thirty years ago. We had our didactic lectures and weekly visits of thirty or forty students, following the professor through the wards. Some out-patient work was demanded, also bandaging on models, and the application of splints and apparatus. Once a week, operations were performed in the large amphitheatre, attended by

students from all the classes. As most of these operations were external, the student obtained a fair understanding of their general conduct and technique, and learned to admire the resourcefulness and brilliant operations of the master surgeons. Anatomy was considered of great importance, and was closely linked with surgery at the Harvard Medical School. A fourth-year course in anatomical landmarks and operative surgery, although an elective, was eagerly chosen. There were surgical clinics, in which the diagnosis was made by the history, symptoms, and physical examination, aided by a few simple tests. None of the more modern methods of investigation were then known. To become a successful teacher, long experience and a strong personality were necessary. There was very little surgical research, and practically no animal work. I was present when the late Professor Halsted of Baltimore came to the school and demonstrated the advantages of learning intestinal suture on dogs rather than on human beings. These were the days when surgeons came from far and near to see Dr. John Homans perform ovariectomies with a large trocar, pedicle clamp and the Staffordshire knot; and hysterectomies with Koerberle's wire clamp, a turn a day, until the stump slipped back, at the end of a week.

From that time until now, certain tendencies have become more and more clear. Anatomy, exceedingly well taught, has become, with one exception, largely divorced from surgery, and the surgeons no longer work and teach in the ana-

*President's address before the New England Surgical Society meeting, Burlington, Vt., September 29, 1922.

tomical department. Operative surgery has been omitted. Work on animals for technique and research has much increased. The huge ward visits of the second and third year have been replaced by small sections, and in the fourth year, under personal supervision, the student, for two months, spends the day in the ward, laboratory and operating-room, in intimate contact with patients. The big amphitheatres have come to be less and less used, as internal operations increased, and were performed in small rooms. No longer do we see the silent group about the table, but in most clinics, the case is discussed, the steps of the operation are explained, and the surgeon must *operate and teach*, at the same time, in order to maintain attendance and attention.

With the gradual development of sub-departments of surgery, such as genito-urinary surgery and orthopedies, with the still further division into such specialties as brain and nerve surgery, etc., with the still more refined methods of diagnosis and special operative technique, it became impossible for a student to acquire the necessary knowledge in four years.

In addition, came the innumerable methods of investigation in the laboratory, and all sorts of special tests, with all of which he must have some familiarity. Instead of graduating for practice at the end of four years, not a few, but a large majority of the students now add an internship of one or two years; at the large hospitals, a paid resident surgeon's appointment is sought by an increasing number of hospital graduates. Year by year, a change has come over medical teaching. The younger man, without great experience, but with enthusiasm and knowledge of modern scientific research, is giving much of the instruction to small groups of students.

Commencing this year, the Harvard Medical School is to make a definite change in its curriculum. The Faculty has become convinced that the students' hours are too much occupied, and emphasis is to be placed on the fundamental subjects. Accordingly, the number of hours devoted to didactic lectures, and to a less extent to the clinics, has been reduced about one-third in the major subjects, and still more in the specialties. Two afternoons a week are left free for study or a choice of voluntary courses, offered by the various departments. If the making of a thoroughly competent surgeon is to require all these years of undergraduate, hospital, and post-graduate work, there must be established some standard in the future, by which such an ethical and qualified man may become known to the community; a standard, which in time, will be insisted upon by the general practitioner and other surgeons. For this reason, in spite of inevitable mistakes, I believe all of us should do our utmost to aid the work of the American College of Surgeons.

During the last ten years, in the large hospi-

tals, special assignments of a group of similar cases, where unsolved surgical problems existed, have been given to one or more individuals for a specified time. After an intensive study has been carried on, and the end-results of the treatment determined, the plan is to return these cases to the general service, or to reassign them to other individuals. At the Massachusetts General Hospital under this system, we formed the fracture service, and have assigned such rare cases as cancer of the cervix, pulmonary surgery, peripheral nerve surgery and toxic goitres, believing that more advance would thus be made, than if a member of the general staff had only an occasional case. Such specialization must, however, be limited, otherwise the general service suffers, while the individual may acquire an undeserved reputation as the only man who can do a certain kind of work. I suggest that this same system is even more valuable in hospitals of moderate size where, in addition to a few months of regular service, an individual would have a small series of cases for a year.

Throughout the country, less and less surgery is done in the private house. The day of the emergency appendix with the pocket knife, spoon retractor, candle snuffer, and a bit of twine has passed forever, unless it be in some remote farmhouse (if such exists), where the Ford car cannot penetrate, and bring the patient to the hospital. Gasoline transportation and the remarkable growth of the small hospital, both public and private, have entirely changed the aspects of modern surgery, and introduced new questions, to which the answer is very difficult. In almost every large town in New England, there is now a hospital, with a regular staff in attendance.

In our present stage of evolution, no special qualifications are necessary for the practice of surgery. At such a hospital, there is almost always a good operating-room, in charge of an excellent nurse. According to its size and endowment, there is an x-ray apparatus and a laboratory, with more or less scientific equipment. To such a hospital are now brought two types of cases,—the emergencies, to be operated upon by the local surgeon or a consultant, and many chronic cases for diagnosis, and perhaps too often for surgical treatment. These cases were previously taken by the general practitioner to a larger medical center, often to the chief cities.

There is a marked difference between a case of appendix peritonitis and one brought in with a questionable diagnosis of chronic ulcer or cancer of the stomach. In the first, the diagnosis is obvious, and immediate treatment is indicated. A reasonably qualified man should be successful. In the second case the diagnosis and treatment may be doubtful, and will often require either very special methods of examination, an unusual experience in similar cases, or a technique learned by long practice only. The question,

"Should the operation be done?" depends often for its answer on another, "Who is going to do it?" This same question arises sometimes within the walls of large hospitals. The Utopian ideal that the patient should always have the most competent surgeon will never come true, but it is to such societies as ours that the community looks for guidance. Quietly, tactfully, but firmly, we should do all in our power to influence the general practitioner, with whom the final decision rests, to send his patients only to ethical and qualified men. We should ourselves realize, furthermore, that with all the modern refinements in diagnosis and technique it is no disgrace for a general surgeon to refer a patient to another man, unusually qualified in a particular field.

I have spoken of the long course of study and hospital work, which a modern surgeon must take. To this, fortunately, there are exceptions. Such is the energy in this country of many men, that they give up practice for a time, travel, visit clinics, take post-graduate work, and owing to natural ability, make of themselves competent, practical surgeons. So long as such men recognize their limitations, the community is safe.

Far too many laparotomies are done without preliminary study; many a so-called interval appendix has been removed because the operation was easy and safe. Further study showed ureteral calculi. It is appalling how many cases of cancer of the rectum are diagnosed, and occasionally operated upon for hemorrhoids, without even a high rectal examination. Many of these errors come from improper interpretation of x-ray plates, unreliable technique in carrying out laboratory work, and in taking as a fact, the results of special investigation, in which the worker lacks both training and experience. On the other hand, we have nothing but admiration for the surgeon who, finding unexpectedly a condition beyond his ability to treat, closes the wound, and refers the patient to a more experienced consultant. It would take too long to discuss other important changes. Without further comment, I will mention the increasing activity of the State and Public Health Service, Industrial Surgery, with its rapidly increasing efficiency, the Workman's Compensation Board, Social Service, Diagnosis Clinics at the hospitals, and Group Medicine in private practice. All these and other problems must work out salvation.

Before closing, I wish to thank you for the honor you have done me, and to assure you of my continued interest in our society. May I add a thought in a lighter mood? For centuries the cause of lues was sought, and sought in vain. When found at last, it proved to be a *corkscrew*, thus justifying the time-honored association of Bacchus with Venus.

Original Articles.

FACTORS IN DYSPEPSIA.*

By FRANCIS W. PALFREY, M.D., BOSTON.

DYSPEPSIA is commonly understood to mean discomfort connected with gastric digestion in cases where the diagnosis of organic disease such as ulcer or cancer cannot be established. Since it occurs in different types, it is desirable to recognize these by speaking in the plural of dyspepsias. These figure prominently in general medical practice, but our knowledge of them is not yet such that we can treat them either rationally or empirically with complete success.

The subject of the dyspepsias has interested me from the fact that it has baffled us in the past, in spite of the many hints that seem as if they ought to offer solutions, if only we could read them. It is a tantalizing situation, since so much seems to lie so little beyond our grasp. But the hopeful factor to me has been the feeling that the more searchingly I have gone into individual cases, or groups of cases, the more suggestions I have obtained tending to connect clinical symptoms with deviations from the normal physiology.

My method of attacking the subject has been different from that of most recent investigators, in that they have devoted themselves more largely to objective tests, whereas I have attempted the more uncertain and less scientific method of trying to identify and analyze the patients' subjective symptoms. I must admit that I am attempting to build on insecure foundations, and that my structures are not safe against falling to the ground. Still I feel that there is a chance that by ascending these insecure structures I may get a wider view than if I were to put all my material into foundations. We must remember that dyspepsias are complexes of symptoms, rather than objective cachexias. Most patients do not complain primarily of undernutrition, but rather of discomforts connected with digestion. Many patients who complain of dyspepsia are found on objective tests to have no deficiency of nutrition. Also in routine tests individuals are found whose digestive processes deviate markedly from the normal, both in the directions of deficiency and of excess, but who, in spite of these deviations, have no symptoms of dyspepsia. It seems to me, therefore, that, both in investigation and in clinical dealing with the individual case, we should deal primarily with symptoms, and with other abnormalities only as they may contribute to symptoms. The patients come to us for relief of certain discomforts, and it is only by learning to identify symptoms from the patients' descriptions, or from other evidence, and by

*Read before the Fall River (Mass.) Medical Society, March 22, 1922.

learning ways by which these symptoms may be remedied, that we can furnish such relief.

Gastric digestion is a complicated and delicate process. I remember vividly a demonstration early in my medical school course, in which the stomach of a dog killed immediately after a full meal, was laid open to view, showing a large, moist mass composed of lumps of meat, bread and potato. A dog's dejections are the familiar small masses and coils of homogeneous fecal material; and even of their small bulk only a part is formed of material ingested, the chief bulk being composed of bacteria which have grown in the intestine. Most of the bulky meal, therefore, is digested and absorbed. Of course the absorption and part of the digestion occurs in the intestine, but the stomach begins and makes important progress in the process.

The chief functions of the stomach are two. First, it receives each meal for temporary storage, and passes it along little by little through the pylorus into the intestine, as the small intestine is able to receive it and attend to it. Second, it has the function of digesting or reducing to a fluid state all protein substances,—meat, fish, cooked egg, milk curd and vegetable proteins. In addition to this, some conversion of starches and sugars under the influence of the saliva may go on in the fundus, and the peristalsis in the pyloric portion may have some mechanical effect in dividing soft solid particles, but these actions are probably of little importance.

Viewing thus the digestion in the dog,—and human digestion is undoubtedly closely similar,—the course of gastric digestion, wonderful as it is, seems at first sight fairly simple and trouble-proof. We have all seen the disappearance of a slice of coagulated egg albumin incubated in a test-tube of pepsin-hydrochloric acid solution. We have all been taught that the mucous membrane has a natural immunity to this pepsin-hydrochloric acid. We can watch the peristaltic waves of the stomach under the fluoroscope until the stomach is empty. It is hard so far to see why anything should ever go wrong.

But let us transfer our attention from the dog, who cannot complain of dyspepsia, to the human being. All the facts that I have mentioned above apply also to human digestion. Yet certain human patients, in whose gastric contents according to our ordinary tests no notable abnormality is found, and in whom the radiologist recognizes no departure from what he considers normal in the position, outline, or movements of the stomach, still complain of discomfort which, they are convinced, is connected with their digestion. This leads us to suspect that we have been too hasty in regarding the stomach as a chemical and mechanical automatic machine which should not get out of order, and that disturbances may occur in it

which our present methods of objective examination are not sufficiently delicate to detect.

The truth seems to be that although a normal stomach under normal conditions is practically sensationless and automatic, the stomach is an organ which is far more sensitive than I have suggested hitherto to influences which may cause it to produce abnormal sensations and to depart from its normal function. In this way it is to be contrasted with the heart. If the stomach were as incapable of originating sensations as the heart ordinarily is, if gastric peristalsis were as free from factors which disturb its action as the myocardium, and if the pylorus were as uniform in its action as the heart valves, I suspect that dyspepsia would be less frequent. But the stomach is a more temperamental organ, and is also called upon to adjust itself to more variable conditions. It is lined with a mucous membrane which, we know, under excessive stimulation becomes hyperemic. Although it seems to be less endowed with a function of sensation than is the skin, still it is hard to admit that it is not capable of sensations of discomfort or pain when it is subjected to unfavorable influences, as, for instance, after the ingestion of corrosive poisons. And it is constantly exposed to varying influences, not only to the wide variety of food and drink ingested, but also to changes that may occur in these while they are in the stomach, and also to its own powerful chemical secretion. The motor function of its musculature and the secretory function of the mucous membrane are peculiarly subject to influence by circumstances of environment, emotions, and sensations not primarily involving the stomach, such as those of taste and smell. Also the stomach for normal functioning requires normal functioning of its two orifices; and both of these, according to my conception, are liable to misbehave without reference to hitherto recognized organic disease.

First, as to the pylorus. I have already mentioned that the stomach receives food for storage and peptic digestion, and discharges it little by little to the small intestine. The pylorus has absolute control over the rate of discharge. If the pylorus is closed nothing passes. If the pylorus is open it requires little force of gastric peristalsis to cause any fluid contents to pass. Now clinical investigators in the past, in their enthusiasm for chemical gastric analysis, have described conditions in which they found highly acid liquid contents in the stomach. They jumped at once to the conclusion that this was necessarily due to an excessive rate of secretion of hydrochloric acid, overlooking the alternative possibility that retarded discharge of the normal amount of secretion could cause the same findings, and that also, granted the existence of an excess of gastric secretion, a sufficiently permeable pylorus would rapidly drain the excess away. There is reason to suspect, therefore, that the pylorus, from its command over

the outflow from the stomach, may by improper functioning cause or contribute to abnormal conditions within the stomach; especially by retaining in the stomach food and secretion that so far as the stomach is concerned are ready to pass on to the intestines.

This leads us to consider what is known of the pylorus and its action. The pylorus is the narrow outlet of the stomach, with its surrounding sphincter of smooth muscle, which, when in contraction, closes the outlet, and, when relaxed, leaves the outlet patent. It is occasionally capable of tight spasmodic contractions, which have been described by surgeons as seen by them at operation. But such pylorospasms are unusual and abnormal. On the normal behavior and control of the pylorus our best evidence is from the extremely important observations of Cannon.¹ Cannon reports that in normal digestion the pylorus is closed, but that it relaxes and allows the passage of a jet of gastric contents at more or less periodic intervals under the following conditions: The first signal for opening of the pylorus is the appearance of free hydrochloric acid on its gastric side. Then a jet passes into the duodenum and the pylorus closes, apparently from the effect of the presence of acidity within the duodenum. The pylorus then remains closed until the acidity of the contents of the duodenum is neutralized, by the pancreatic juice, the bile and the duodenal secretion. Then, if there is still free acid on the gastric side, the pylorus again relaxes and another jet passes. And so the process goes on, the pylorus acting as a flood-gate to admit acid gastric contents to the duodenum only in such amounts as can be neutralized promptly in preparation for pancreatic digestion. It is true that there is reason to suspect that this action of the pylorus is sometimes in abeyance. Water seems to pass through the stomach more rapidly than is consistent with its subjection to this process. In some cases of achylia gastrica the stomach seems to empty even more rapidly than normally in spite of absence of the acid signal for opening of the pylorus. Also McClure, Reynolds, and Schwartz,² in certain experiments on human cases, have failed to obtain evidence that these cases under the conditions of their experiments behaved in accordance with Cannon's theory. But these observations do not seem to me sufficiently representative of all conditions of normal digestion to warrant our discarding the whole theory. They rather seem to me to point to exceptions. Also Alvarez,³ from his work on the muscular action of the digestive tract, throws doubt upon the chemical control of the pylorus, and in his concentration upon peristalsis seems to discount or even at times to disregard the action of the pylorus. But Cannon's findings are too exact, and his theory is too consistent with what the pylorus should do for the protection of the duodenum and jejunum, to be seriously doubted.

I have already expressed the opinion that when acid fluid contents are retained in the stomach,—and this includes many cases of ulcer as well as many that are still considered functional dyspepsias,—the fault must be laid to the pylorus. Considering this in the light of Cannon's teachings, it has long been my belief, since in these sufficient acid is clearly present to furnish the first signal for opening, that the difficulty may lie in the neutralization of acid in the duodenum, by the pancreatic secretion, the bile and the intestinal secretion.

The suspicion therefore arises that in dealing with dyspepsia of the so-called hyperacidity type, with or without ulcer, we may be dealing with stomachs which are not themselves primarily at fault, but which are forced to complain because the organs whose secretions enter the duodenum are not keeping pace, and consequently the stomach's finished work is accumulating on its hands.

This leads us to consider what is known of the factors which control the flow into the duodenum of these neutralizing secretions. The pancreatic juice is probably the most important of these since it is the most strongly alkaline in reaction. Unfortunately, in man there are few observations as to its flow; these show merely that the flow takes place during the period of digestion. In animals it is shown that the flow varies in amount and in duration according to the type of food given, and that it is stimulated by the presence of acid in the duodenum. This stimulation by acid in the duodenum seems to be not a nervous but a chemical one, since by treating duodenal mucous membrane with weak hydrochloric acid a product is obtained which on intravenous injection into animals will cause an increase in the flow of pancreatic juice. We have, however, no proved clinical means of increasing the pancreatic juice in man. Of the duodenal secretion still less is known. The bile is probably of less importance than the pancreatic juice as a neutralizer of acid, since it is less strongly alkaline and is normally no greater in daily amount. It seems to be secreted continuously, but discharged into the duodenum intermittently, chiefly as chyme enters the duodenum. But over the flow of bile we have more control. As Pfaff and Balch⁴ have shown, its amount can be increased greatly by the giving of ox-bile by mouth. Clinically, as I have reported before⁵, the administration of bile or bile salts so as to increase the amount of bile is of service in improving the so-called hyperacidity symptoms. If any theoretical suspicions are correct a method of stimulating the flow of pancreatic juice, if we had one, might be of still greater advantage; but even if my theory is wrong, I can still vouch for the fact that bile preparations give symptomatic improvement.

The cardiac orifice of the stomach has received surprisingly little attention in medical investigations except as an opening through which the stomach is entered. It is to be inferred from

such current teachings as bear upon the subject at all that the cardiac orifice should normally resist all passage in the upward direction, whether belching, regurgitation or vomiting. It is my observation, however, that few persons are free from a little, effortless, half unconscious belching after meals, and that such effortless belching, where noticed at all, is an act commonly attended with some slight satisfaction, and seems to indicate a wholesome rather than a disordered gastric function. On the other hand, as I think you will agree, a desire to belch but an inability to do so without marked effort or at all,—“gas on the stomach” or “gastric trouble” as patients are fond of calling it,—occurs with conditions of digestion not satisfactory to the patient. Regurgitation and, still more, vomiting are always abnormal. But in these acts, too, especially in vomiting, it is a matter of common observation that the act may be easy or difficult, and that where it is difficult it involves a more serious disturbance. The cardiac orifice itself is surrounded only by a weak sphincter of smooth muscle, capable of resisting only little pressure. But the oesophagus in man approaches the stomach somewhat obliquely, entering internal to and behind rather than above the fundus. It is strongly suggested to my mind that, in patients who have difficulty in belching or vomiting, the difficulty may be the result of lateral pressure or kinking of the cardiac orifice or lower part of the oesophagus. While I have no proof of this I offer it as a possibility which seems to me to deserve consideration and further investigation.

The stomach as seen at autopsy or by fluoroscope always has contents of two kinds in varying proportions, the fluid or semifluid, and the gaseous. Our attention in the past has been so largely focused upon the behavior and disposition of food, drink and secretions that we have been prone to forget the gaseous contents. Still it seems to be a provision of nature that the stomach should be in part filled with gaseous contents, and provisions of nature are, as a rule, not without some useful purpose. The gaseous contents of the stomach have been sufficiently studied to show that, unlike the gases of the intestines, they are not products of fermentation and putrefaction, but almost entirely air. Moritz⁶ has shown that the pressure is normally about 8 cm. of water, and that pressures of 20 cm. or over cause discomfort. Now it is commonly taught that the stomach is normally protected against increases in internal pressure by a mechanism through which each swallow ingested, results in a corresponding relaxation of the gastric musculature. But I have already alluded to the sensitiveness of the gastric musculature to various influences. It seems too much to expect of an organ with such an erratic musculature to maintain always normal internal pressures without a safety valve. It is strongly suggested to me that such a safety valve is to

be recognized in the normal cardiac orifice in communication with the normal gas-bubble.

If this is true, such abnormal difficulties of upward passage through the cardiac orifice as I have suggested above may well explain uncomfortable feelings of pressure within the stomach.

Now, looking back over what I have said so far, let me enumerate the abnormal conditions that I have mentioned which seem to me to warrant suspicions that they may be the bases of symptoms. First, hyperemia of the mucous membrane. Second, abnormalities of secretion, either in the direction of excess or toward diminution or absence. Third, abnormal motor action, increased, diminished or disturbed. Fourth, retention by the pylorus of gastric contents ready to pass into the duodenum. Fifth and last, valve-like resistance of the cardiac orifice.

Hyperemia of the gastric mucous membrane was seen by Beaumont⁷, nearly a hundred years ago, when through the gastric fistula of his patient, St. Martin, he viewed the interior of the stomach under a variety of conditions of stimulation. The mucous membrane had markedly this appearance of hyperemia following St. Martin's over-indulgence in alcohol. For symptoms that may be connected with such hyperemia, therefore, we may get suggestions from those which occur after the ingestion of overstimulating substances or after overuse of alcohol. In such conditions the most constant symptom is a burning sensation or “raw feeling” in the epigastrium commonly known as heartburn or pyrosis. There is also a tendency to vomit, more or less promptly, after the ingestion of food. These two symptoms seem to me strongly suggested as subjective manifestations of this hyperemia. These same symptoms, it is true, do not occur only after the ingestion of irritants. They occur also in the so-called “acute catarrhal gastritis” and in connection with acute infectious diseases. But reasoning backward, it does not seem to me improbable that here too we have a hyperemia of the gastric mucosa, perhaps from catarrhal inflammation. So I have come to the tentative conclusion that heartburn with a tendency to vomit is evidence of hyperemia of the general gastric mucosa.

But heartburn in these cases which I suspect of representing general hyperemia of the gastric mucosa is rarely intense, except in corrosive poisonings with probable erosions or ulcerations, and in pronounced cases is less prominent than the tendency to vomit. Severe heartburn, on the other hand, is more common in connection with accumulations of acid contents due, according to my conception, to delayed discharge through the pylorus. In these there is less tendency to vomiting. It is suggested to me that these cases of heartburn with acid contents and less tendency to vomit represent irritation chiefly of

the pyloric portion of the stomach, whether hyperemia, erosion or ulcer.

Abnormalities of secretion and of muscular function often seem to bear some relation to each other and are therefore best considered together. Both are found to vary from the normal either in the direction of deficiency or toward excess, and often apparently in sympathy with each other.

First, there are cases in which there seems to be a general inhibition of normal functions of the stomach. An instance of this which I met some years ago is as follows. A physician, 60 years of age, who had previously had a normal digestion, had his first attack of angina pectoris (of which he died suddenly less than a year later) within half an hour after a heavy noon meal containing steak and potatoes. The attack of angina was severe and typical, and he knew what it meant. Through the afternoon and night he was excited and apprehensive but not notably uncomfortable. At eleven o'clock the following forenoon, twenty-three hours after the meal had been eaten, he was nauseated and vomited a large amount of the meat and potato eaten the previous noon, and these articles in the vomitus showed no evidence of digestion during their twenty-three hours in his stomach. He had no further digestive trouble. He had had amyl nitrite but no morphia.

This case has always seemed to me an unusually good example of complete inhibition of gastric digestion, due either to the severity of the angina pain or to the psychic disturbance resulting. But similar instances of vomiting of little digested material after shorter intervals are not rare. They occur especially when the food has been eaten during excitement, distress or illness, or when the same influences have become active shortly after a meal. The chief symptoms that we can associate with such occurrences are disinclination to take the food, and, after it is taken, a sense of constant weight in the epigastrium and gradually increasing nausea until the vomiting occurs. Such vomiting may be an isolated event in the life of the patient. But there are also cases which may be considered to form one class of chronic dyspepsies whose condition consists of such symptoms recurring frequently or constantly. These patients complain of poor appetite and say that what they do eat "lies like lead" in their stomachs; they frequently have nausea and this sometimes leads to vomiting; they are apt to be persons of poor muscular development and posture, and to have headaches and nervous exhaustion. Analyses of gastric contents are apt to show subnormal acidities, and the fluoroscope often shows atonic and not seldom prolapsed stomachs. An occasional variation upon the usual symptoms in some of these is the appearance at irregular times of a strong craving for food, which may or may not be well tolerated. It is reasonable to consider such symptoms as manifestations in gastric function

of states of nervous exhaustion and instability.

Achylia gastrica, or the condition of continuous absence of gastric secretion, is of disputed nature. It may belong in the above group, but the gastric and general symptoms are often less marked, and the motility may be normal or increased with rapid emptying of the stomach. It is worth noting in connection with what I have said as to the function of the pylorus that achylia cases are apt to have intestinal symptoms.

Conditions of increased secretion are a little difficult to distinguish from those which, according to my conception, are not conditions of increased secretion but rather conditions of accumulation of normal secretion by delay of its discharge through the pylorus. It is my belief that many cases that have hitherto been considered as due to increased secretion in reality are due only to abnormal accumulation. Still there can be no doubt that in cases called hypersecretion or gastrosuccorrhoea, in which the stomach, even in the absence of food, fills with large amounts of acid gastric juice which has to be vomited or washed out, there must be an excess of secretion, and a disturbance of the normal timing of secretion in response to food. We must recognize therefore that hypersecretion exists, and although the extreme cases are rare, less marked cases are undoubtedly more common. At the same time, it seems to me necessary to assume that when these accumulations of acid secretion in the stomach develop, their accumulation must mean that the pylorus has not risen to the occasion to supply an outlet for it. The chief symptoms are a feeling of fullness increasing to a pain of a quality which suggests either pressure or muscular contraction, and then vomiting of large amounts of acid fluid. The possibility of pylorospasm, in addition to increased secretion, is strongly suggested.

The activity of muscular contractions of the stomach as seen by the fluoroscope, in cases with normal or highly acid contents, may be deficient, normal or increased. It has been my impression that, provided the mucosa, the secretions and the behavior of the orifices are normal, the variations in muscular action are of no great importance in the production of symptoms. Atony or deficient peristalsis in connection with deficient or inhibited secretion has been mentioned already. There is reason to suspect that increased peristalsis or increased tonicity may contribute to the symptoms in the hyperacidity syndrome, or in the cases that I attribute to valve-like resistance of the cardiac orifice, producing the sense of epigastric pressure. But in these I take the motor disturbance to be a contributing and not a prime cause of the trouble. Still, it may be that if Alvarez's theories of the interrelation of the peristaltic activities of the digestive tract as a whole are developed, we may receive new illumination.

My belief that the type of dyspepsia hitherto known as hyperacidity has its basis, at least in part, in a not sufficiently rapid discharge of acid contents through the pylorus, gains support from an examination of the associated symptoms. The intelligent patient commonly gives the following story. At meal times he is hungry but he fears to eat much because he has found that a full meal will cause him to suffer later. After eating he soon begins to feel a burning discomfort in the epigastrium, gradually increasing. He feels that this discomfort comes from the place where the meal has gone to, as if the meal were burning or irritating whatever is surrounding it. He may belch wind but that gives little or no relief. He is apt to regurgitate, and the fluid which rises to his throat is sour and irritating, convincing him that the distress down below, where this sample came from, is due to the irritant quality of this fluid. If the trouble gets bad enough he vomits, and then feels better. From that time on, he knows that emptying the stomach will give relief. During his symptoms his constant wish is that the contents of his stomach would pass through more quickly in the normal manner, but he often becomes discouraged in waiting for them to do so, and induces vomiting. He usually learns that sodium bicarbonate will give temporary relief and uses it frequently, but recognizes that it is only an aid in tiding over the single period of discomfort in which it is taken. Let us attempt a translation of this account into medical terms. Heartburn, or burning sensation where the meal lies in contact with its container, may be translated as an irritated state, probably a hyperemia, of the mucosa of pyloric portion of the stomach; belching and regurgitation, as increased tonicity or motor activity of the stomach in response to irritation; acidity and irritating quality of regurgitated fluid, as pepsin-hydrochloric acid; relief by vomiting or by taking soda, as evacuation or neutralization of pepsin-hydrochloric acid; sense that the discomfort would be relieved if the meal would pass out of the stomach more quickly, as retention by the pylorus. From this translation we may construe the theory that in these patients the symptoms are caused, or at least contributed to, by irritation of the stomach from the accumulation of pepsin-hydrochloric acid, continuing until this pepsin-hydrochloric acid is removed. The patient who has studied physiology says that this is entirely in accord with his sensations. But here we meet with objections: that free hydrochloric acid and pepsin are in contact with the pyloric mucosa in all normal digestion but produce no discomfort; it is a time-honored teaching of physiology, and obviously true in all normal men and animals, that the gastric mucosa is immune against the action of pepsin-hydrochloric acid; also, it is currently taught that the stomach itself is incapable of sensation, and that the burning sensation which seems to come from the stomach

is really due to acid regurgitation into the oesophagus. These teachings have been accepted by physicians, adding to the mystery of the situation. But they do not satisfy the patient. He insists that his stomach at least is not immune or sensationless. He can feel the burning and knows that it comes from where the food lies that he can still feel in his stomach. Nor is he better pleased with the suggestion that his trouble is 'gastric hyperaesthesia' and a neurosis.

Let us consider these subjects of sensation and of the immunity further. First, as to the supposed lack of sensation of the stomach. This has been inferred from experiments in which hydrochloric acid solutions introduced by tube into the stomach resulted in no sensation. But to my mind this is not conclusive since the experiments do not seem to have duplicated the condition of long contact which we assume to occur in our patients. And as to the immunity, is it reasonable to suppose that this immunity is absolute, as if the stomach were lined with platinum? Is it not more consistent with most facts of physiology that it should be only a relative immunity, ordinarily sufficient but liable to break down when too strenuously attacked? We know that it breaks down in gastric ulcer which is only a step beyond the condition which we are considering. May not the truth be that pepsin-hydrochloric acid, when it is not passed on through the pylorus in proportion to the rate of its formation, can, by accumulation and long contact, repeated after every meal, break down this immunity, so that in the end the gastric juice does attack the mucosa, causing irritation, hyperemia, erosion or even ulcer? And if this occurs, is it not more the fault of the pylorus in not passing on the eroding fluid, even if this is formed in excess, than the fault of any increase in secretion; and might not an abnormally sluggish pylorus produce the situation with no increase of gastric secretion at all? I believe all this to be probable although it is at present incapable of proof.

The symptoms of a resisting cardiac orifice seem to me obvious when once our attention is directed to them, and surprising only from the lack of attention that they have received in the past. Their neglect in the past I can explain only on the ground that discomforts due to resistance to belching are seldom severe enough in themselves to be disabling, and reach their severest grades in connection with other disorders which have distracted attention from them. In the minds of patients, and also of some physicians, there is a misconception of what belching means. Many patients conceive of the "gas" which they raise in large volumes as a product of fermentation, whereas the truth is that gas-producing fermentation in the stomach of any importance is seldom if ever met except in the cases of marked organic stenosis of the pylorus. Except in these cases with a rare organic disease the "gas" raised is

simply a specimen of the air that is normally in the stomach, or air that has been swallowed in "eribbling," expelled on account of increased tonicity of the stomach. I have already expressed the opinion that easy, quiet belching is to be regarded as a normal process intended to insure the intragastric pressure against undue elevation. But certain patients have more or less habitually a sense of pressure in the epigastrium which they feel should be relieved by belching, but they are able to belch only with difficulty and unsatisfactorily. With the feeling of unrelieved pressure in the stomach are often associated jerky spasmodic contractions of the epigastric muscles (perhaps also of the diaphragm), which are more or less uncomfortable. Patients with these symptoms often resort to the various dyspepsia tablets containing sodium bicarbonate with an irritant aromatic. These, while they usually give temporary relief, tend, when taken habitually, to set up further irritation. Many patients also learn the trick of eribbling, which also seems to aggravate the disorder. Sometimes, too, the symptoms of inability to regulate intragastric pressure are associated with, and increase, the discomfort of other disorders, such as the hyperacidity complex.

From these considerations the following classification of common types of dyspepsia seems to me suggested:

First. Irritable, irritated, very likely hyperemic, states of the mucosa, from improper diet, drugs, alcohol and perhaps catarrhal inflammations, with as presenting symptoms mild pyrosis or "raw feeling" and, in severer instances, a tendency to vomit promptly on the ingestion of food.

Second. Depressed or inhibited states of secretory and motor function, due largely to reflex and psychic influences, with the presenting symptoms of anorexia, sense of weight in the epigastrium, nausea, and vomiting of food not digested in proportion to the duration of its retention in the stomach.

Third. Hypersecretion or gastrosuccorhoea with probable pylorospasm, with as symptoms an increasing sense of fullness, pain, and vomiting of acid fluid in which undigested food is less in evidence.

Fourth. Those cases to which the term hyperacidity is so generally applied that it is not likely to be given up readily, but which, according to my belief, are fundamentally due to a rate of pyloric discharge which is not keeping pace with the acid secretion in the stomach, whether the latter is increased or only normal. This insufficient rate of discharge through the pylorus may be due to deficiency in the neutralizing fluids of the duodenum. The symptoms I believe to be due to irritation, hyperemia, erosion or, in extreme cases, ulceration of the mucosa of the pyloric portion of the stomach, and are: heartburn, acid regurgitation, sense of unduly prolonged retention, and vomit-

ing, often voluntary, for relief. This group differs from the preceding one in that there is not necessarily an excess of acid secretion, and in that pyloric discharge is not abolished; it is going on, but not rapidly enough to keep pace with the secretion.

Fifth. Valvular cardia, with the principal symptom of a sense of epigastric pressure not readily relieved by belching, which may become exaggerated into habitual noisy belching and eribbling.

Combinations of more than one of the above may occur, and some may be aggravated by the coexistence of motor disturbances not yet identified.

Now, how are these five types of disorder to be treated? Here, for lack of time, I must confine myself to general principles. Besides, the details must vary somewhat in each individual case.

First, as to the group which I have attributed to irritability, perhaps hyperemia, of the lining of the stomach, due to irritants ingested or perhaps sometimes to catarrhal inflammation. Here the keynote is to put a stop to the irritation. In severer cases where some of the irritant may be still in the stomach, vomiting should be encouraged by giving warm water, or the stomach may be washed out; then the stomach should be rested by a fast of from twelve to twenty-four hours or more, in which nothing but sips of water or cracked ice are taken. If vomiting is violent after the stomach is empty a small hypodermic of morphine or atropine may be given. But the requests and suggestions of friends that various things be given by mouth "to stop the vomiting" are best rejected. I suspect that there is a stage, if we could recognize it, in the subsidence of these irritations, in which mild stimulation as by certain foods, by capsicum, nux vomica, ginger or champagne may do good. But I am convinced that in practice these more often do harm by increasing and prolonging an irritation that would have subsided sooner under simple rest and starvation. Returning appetite is commonly an indication that feeding may be resumed with milk and lime water in small amounts, then gruels, milk-toast, etc., up to a normal child's diet, and then on to a simple adult diet, with cautions against return to the indiscretions which caused the original disorder. In mild or chronic cases restriction to a simple diet of limited amount, without fried foods, pastry or strong flavorings, and enforcement of mastication, may be sufficient.

Second, as to the group of depressed gastric functions. One of the strongest hints as to the line of attack in these is the very striking improvement that often occurs in these patients if they can be given a complete change of scene or vacation in congenial surroundings. Most cases when they apply for treatment are in a state of discouragement and maladjustment to

their environment from which they see no way out. Many difficult situations are presented, but it is generally true that more can be accomplished by encouragement, and improvement of the general circumstances of daily life, both mental and physical, than by diet and drugs. In diet the most important point is to be sure that the patient has his meals at regular hours at a good home- or boarding-house table and eats moderately of what is provided, resisting the opposing temptations either to omit meals or to eat irregularly between meals. Of drugs, *nux vomica*, with a little dilute hydrochloric acid before meals, sometimes works well as a temporary expedient.

Hypersecretion with pylorospasm, failing more exact knowledge, we have to set down as a neurosis of secretion and contraction, or a reflex of unknown source. On this basis and on empirical grounds treatment should attempt to provide for a calm state of mind during meals and during their digestion; slow, moderate eating, with thorough mastication, and avoidance of articles which are believed to stimulate acid secretion, notably spices, meat flavorings and products of frying. Sometimes the attack seems to be directly precipitated by strongly acid drinks, so these should be particularly warned against. *Belladonna* and *atropine* seem to be of value. In attacks, milk of magnesia or sodium bicarbonate should be given freely, and if the spontaneous relief from vomiting is delayed, the stomach may have to be washed out.

Fourth, the group called hyperacidity, with heartburn and desire for more rapid emptying. Cases of this group are to be suspected of ulcer, according to their duration, severity and obstinacy, and if their symptoms are sufficiently severe, should be put to bed and given one of the accepted gastric ulcer diets even though the special tests of the laboratory and x-ray fail to give a positive diagnosis. Milder cases may be given merely a small bland diet at meal times with crackers and milk at 11, 5, and 10. In all cases, whenever symptoms are present they should be controlled as promptly as possible by magnesium oxide, milk of magnesia or sodium bicarbonate. Where magnesium oxide preparations have the necessary effect they are preferable for frequent use to sodium bicarbonate. But in most cases which obtain temporary relief from these agents which neutralize acid (even including some cases of ulcer), I have found that much can be done to prevent the recurrence of symptoms by giving preparations of ox-bile in enteric coated tablets with the object of increasing the flow of bile. Perhaps the most important practical point that I have to offer is that you can make many patients with sour stomach and heartburn grateful by giving them this bile treatment. Satisfactory preparations are Glycotauro tablets of Hynson Westcott and Dunning, and Ox-bile Tablets of Burroughs, Wellcome & Co. Three tablets should be given three times a day before meals,

or nine a day, for a week, then reducing. At the same time it is well to urge thorough mastication and a moderately conservative diet without alcohol, but closer restrictions in mild or early cases are unnecessary. In patients who obtain temporary relief from milk of magnesia you can be fairly confident that this treatment will give more permanent relief.

Fifth, in cases of valvular cardiac orifice or difficult belching. Not knowing the exact mechanism, we have no direct method of treating the orifice. Our object therefore should be to diminish the need of belching by reducing, so far as possible, the variations of intragastric pressure. This is best done by providing a diet supplying the necessary food value in small bulk, and the day's total should be divided between six meals instead of three at appropriate intervals. All should be eaten slowly and masticated thoroughly. Excitement, which some patients find to increase their sense of epigastric pressure, should be avoided. Patients should be persuaded to restrain all voluntary attempts to belch, and to break the habit of cribbing, which some have without being conscious of it. Irritant dyspepsia medicines should be stopped, but milk of magnesia and enteric coated bile tablets may be used if there are associated hyperacidity symptoms.

Combinations of the above-mentioned sources of symptoms should be treated by appropriate combinations of treatment.

Finally, there are certain general facts that seem to me worth mentioning for their bearing upon the management of cases of dyspepsia of various types. Most chronically disordered stomachs can still receive without symptoms most of the articles of a normal diet if only these are taken with thorough mastication in sufficiently small amounts. Patients in managing their own diets commonly have their attention too much fixed upon *what* they can eat, and pay too little attention to the amounts. Most dyspeptic patients are impatient and meddlesome with their stomachs, rather than gentle and systematic, and so become confused and discouraged. Osler mentions $3\frac{1}{4}$ ounces of meat, two medium slices of stale bread and 1 ounce of butter three times a day as a useful diet in hyperacidity. Smaller amounts of the same foods can be taken by most dyspeptic patients, and it often serves as an encouraging introduction to treatment to show the patient that he can take even small amounts of these substantial foods which he may formerly have feared, giving him reason to hope that he may gradually resume a normal diet.

REFERENCES.

1. Cannon, W. B. *The Mechanical Factors of Digestion*. New York, 1911.
2. McClure, C. W., Reynolds, L., and Schwartz, C. O. Behavior of the Pelvic Sphincter in Normal Man. *Arch. Int. Med.* Vol. 26, No. 4, p. 419.
3. Alvarez, W. C. *The Mechanics of the Digestive Tract*. New York, 1922.
4. Pfaff, F., and Balch, A. W. Secretion and Composition of Human Bile. *Jour. of Exp. Med.* Vol. 2, p. 49, 1897.

5. Palfrey, F. W. Ox-bile in Treatment of Hyperacidity and of Gastric and Duodenal Ulcer. *American J. of Med. Sci.* Vol. 145, No. 6, p. 796, June, 1913. A Reconsideration of the Hypothesis. *Boston Med. and Surg. J.* Vol. 156, No. 6, p. 165, February 9th, 1922.
6. Moritz, Motor Activity of the Stomach. *Zeit. f. Biol.* Vol. 32, N. F. 14, p. 313, 1895.
7. Beaumont, W. Experiments and Observations on the Gastric Juice and the Physiology of Digestion. *Plattsburgh, 1833.*

SOME ASPECTS OF THE PROBLEM OF STERILITY.*

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STERILITY is an important subject for several reasons. In the first place, it is a common condition. One marriage in every ten is childless; hence there are in this country today nearly two million sterile couples who are still at the age of potential child-bearing. Again, sterility is usually a matter of vital concern to the persons involved—in many cases the outstanding sorrow of a lifetime. In the third place, the fact that our native population is less by some millions than it might be is of national economic importance, especially in these post-war days.

The fact of sterility can be diagnosed by any layman. The cause of this condition presents a diagnostic problem of the most complex sort. Let the cause be determined in a given case, and the therapeutic question will be answered. The real problem is aetiology.

From the earliest times the reproach of barrenness has been visited upon the woman. Even in these days the wife is often the subject of unnecessary and harmful treatment when in fact the husband is the one at fault. In forty per cent. of my cases the responsibility has rested with the male. This agrees fairly well with the average of the figures for male responsibility given by other observers.

We may lay down as a cardinal principle, then, that every case of sterility is, in the beginning at least, a two-patient problem. It should be our business to rule out the possible responsibility of the male before coming to any conclusions about the female or subjecting her to treatment, even though she may present some definitely abnormal condition.

The male has a double duty to perform. First, he must produce normal spermatozoa. Second, he must deposit those spermatozoa in his wife's cervix. The older books describe in detail how the uterus dips down into the receptaculum seminis and sucks up semen into the cervical canal by rhythmic muscular contraction. There is no real evidence to support this idea. Sperm which is not ejaculated directly into the cervical canal, or at least onto the os externum, is almost certainly wasted, for its life in the vagina is very brief. In forty-three postcoital examinations made between one and two hours after intercourse I have found living spermatozoa in the vagina only four times. In most of these

cases living spermatozoa were recovered from the cervix. All this is in accord with the more extensive observations of Hühner, and supports his conclusion that spermatozoa deposited in the vagina are usually killed within an hour by the acid vaginal secretions. The occasional case where pregnancy has resulted from semen deposited at the introitus or in the vestibule is of medico-legal interest, but must be taken as a rare exception to the general rule.

Thus the postcoital examination gives us important data about the relative responsibility of husband and wife. If normal living spermatozoa are recovered from the cervix, the male is at once exonerated; more could not be expected of any man. It is not necessary always to see the husband in such cases—an advantage sometimes, when both parties do not share equally the desire for children. It is a curious psychologic fact that a woman often resents the suggestion of possible defect in her husband, while she faces with equanimity the demonstration of faults in herself. Also, we often find that among the uneducated sexual vigor in the male is taken to be proof conclusive of his fertilizing power, and so investigation is deemed superfluous.

If dead or feeble spermatozoa are found in the cervix, and the condom-specimen is normal, we may again conclude that the male is not at fault. The trouble here lies in the hostile action of the endocervix toward normal spermatozoa.

If no spermatozoa are recovered from the cervix, and the condom-specimen is normal, then the difficulty must be of a mechanical nature, and may be due to conditions in either the husband or the wife. In the male one should consider premature ejaculation, stricture, and hypospadias. More commonly, however, the trouble in such cases is with the female. A uterus in moderate descensus allows the penis to pass up behind the cervix, and thus ejaculation into the os externum becomes impossible. If there is any foundation for the popular idea that tall women become pregnant more easily than short ones, it is to be found in the fact that in relatively longer vaginae there is less chance of thus over-shooting the mark. Another condition familiar to all of us is the long conical cervix, often so anteflexed as to bring the external os up against the anterior vaginal wall. Operations such as that of Dudley, designed to correct this abnormality, often fail to cure sterility, because the condition just described is only one manifestation of a general pelvic infantilism. Retroversion of the whole uterus without flexion may likewise bring the cervix up against the anterior vaginal wall. This is a common cause of so-called secondary sterility. The prognosis in such cases is good if the displacement is corrected.

When normal sperm cannot be recovered from the cervix, a condom-specimen should be studied. The more obvious abnormalities of the semen—azoospermia, necrospermia, and marked oligo-

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spermia—are easily recognized. While these are by no means rare, much commoner is another condition which often escapes recognition. I refer to relatively slight diminution in the number and motility of the spermatozoa. This represents the state called by Reynolds "lowered fertility." If such a man is mated with a wife whose fertility also is of low grade, the union is likely to be childless, even though neither person is absolutely sterile. Such a condition of lowered fertility is encountered particularly in those leading a sedentary life and taking an ill-balanced diet. It sometimes responds promptly to the simple correction of hygienic errors. Last November I was consulted by a couple who had one child nine years old; seven years ago there had been a miscarriage, and since then no pregnancy had occurred, though both parties were anxious for children. Every examination of the wife was negative. The husband considered himself to be in perfect health. As a matter of fact, he was about twenty pounds overweight. His diet was faulty, and his occupation, chemistry, was sedentary and confining. His semen showed about half the usual number of spermatozoa; of those present, perhaps twenty-five per cent. exhibited normal motility, while the remainder were feeble or dead. A diet of 2000 calories rich in vitamins was ordered, small doses of calcium lactate and thyroid extract were prescribed, and he was advised to do daily work in a gymnasium. Two months later another specimen of semen was examined, and proved to be normal in every respect. The wife missed her next period, and is now three months pregnant. We should examine semen with a critical eye. Unless the spermatozoa are entirely satisfactory in all of three respects,—number, motility, and morphology,—there is room for suspicion about the fertilizing power of the male.

The grosser seminal defects, many of which are sequelae of gonorrhea, come within the province of the genito-urinary surgeon. The hopeless cases are those where azoospermia is due to atrophy of the seminiferous tubules. Two years ago Frank Lydston proposed that in such cases, when the desire for children was strong, the following procedure might be carried out, with the full knowledge and consent of the persons involved. Sperm from a healthy donor was to be injected, via the vas deferens, into the vesicles of the husband, who would then deposit that sperm in the natural way in his wife's cervix. In one of my cases this was carried out, but without result.

The possible causes of sterility definitely chargeable to the female are systematically listed in the text-books of gynaecology, including everything from imperforate hymen up to absence of the ovaries. Such an impartial anatomical classification is unfortunate, in that the attention is likely to be focussed on some one anatomical condition which may be related only indirectly, or not at all, to the sterility. For many years much importance was attached to

anteflexion of the corpus uteri, coupled with a small cervical canal and so-called pin-hole os. It was believed that in such a uterus the point of flexion at the os internum presented a mechanical barrier to the ascent of spermatozoa, and so acted as a cause of sterility. As a matter of fact, the condition just described is seen in the majority of virgins, most of whom later find it no hindrance to fertility. A canal which can be traversed by the passive blood-corpuscle is not impervious to the active spermatozoon. On the other hand, such narrowness of the cervical canal has considerable significance when there is infection of the endometrium or endocervix, as free drainage is thereby prevented.

Broadly speaking, we may say that ninety-five per cent. of sterilities for which the female is responsible are due to three groups of causes: abnormalities of secretion in the cervix and uterus; mechanical damage done to the Fallopian tubes; and defects in the production of sex-cells by the ovary.

A common group of causes is found in one or another type of hostility on the part of the endocervix toward spermatozoa. The cervical secretion is normally alkaline in reaction. It may become acid as the result of fermentative changes secondary to infection, or as a manifestation of a systemic acid diathesis in the absence of infection. Any marked degree of acidity is rapidly fatal to spermatozoa. These facts have been known in a general way for many years. I have occasionally found living spermatozoa post coitum in a cervix acid to litmus, but never in one which was acid to methyl red. This suggests a line of investigation which is now being followed out, to determine the normal reactions of vagina and cervix in accurate terms of hydrogen ion concentration, and the effect of such concentrations on semen.

Apart from the matter of acidity, infections of the endocervix and endometrium have a hostile action on the spermatozoa in two other possible ways. One is the direct biochemic effect of bacteria and their toxic products on the male cells. The other mode of action is mechanical, consisting either of a profuse outward flow of secretion from the uterus, or more often of a plug of inspissated mucus stopping the cervical canal and entangling the spermatozoa.

In the treatment of these endometrial and endocervical infections dilatation and curettage alone are only occasionally sufficient. The secret of success is the provision for adequate drainage, as in the surgical treatment of infection elsewhere. This is best accomplished, as a rule, by some operation of the Dudley type, which permanently enlarges the cervical canal. At the time of operation and in the course of after-treatment active disinfection of the uterine and cervical cavities should be carried out. When these infections are superimposed on chronic passive congestion of the pelvis, conditions tending to produce this should be corrected. A com-

mon and often overlooked condition of this sort is faulty sexual hygiene.

The commonest single cause of sterility in the female is to be found in old inflammatory damage to the tubes. Most trouble of this sort is the work of the gonococcus, or, less often, of other organisms ascending via the uterus. There are occasional cases, however, where the fimbriated ends of the tubes seal over as a result of low-grade pelvic peritonitis complicating appendicitis. This is common enough to afford an additional reason for not temporizing with subacute or chronic appendix-trouble in young girls.

In the past it has often been very difficult to diagnose tubal occlusion by any means short of exploratory laparotomy. If the acute infection occurred years previously, the history of it is likely to be vague, and pelvic examination may be negative at the time when the patient is seen for sterility.

Two years ago Rubin devised a technique which is very helpful in the investigation of tubal conditions. His procedure consists of the insufflation, under pressure, of gas into the uterus, followed by abdominal x-ray, which will demonstrate a pneumoperitoneum if at least one tube is patent. I have done just over one hundred such insufflations in about forty different patients, and am impressed alike with the usefulness and with the limitations of the method.

The apparatus required is simple. A cylinder of compressed gas is connected to a wash-bottle, in which the visible bubbling serves as an index to the rate of flow. From the wash-bottle leads off a tube which has at its end some sort of nozzle adapted to the external os or to the utero-cervical canal. The pressure of the flowing gas is recorded by a manometer connected to the main channel by a T-piece.

The object is not to produce a massive pneumoperitoneum such as is used in the diagnosis of adhesions or tumors, but merely to demonstrate that some gas does pass into the abdominal cavity. The insufflation of three hundred cubic centimeters is usually sufficient for this purpose. Such a small pneumoperitoneum causes very little discomfort, and so the method is suitable for out-patient or office use. From the diagnostic point of view either oxygen or carbon dioxide may be used equally well. On the ground of more rapid absorption and transient effects the latter gas is preferable.

In the case with normally patent tubes, the gas-pressure at first rises to between fifty and eighty millimeters of mercury, but promptly drops to thirty or forty millimeters as the uterine ends of the tubes are forced open. Almost at once the patient mentions a certain amount of general abdominal discomfort, which she may of her own accord describe as "gas-pain." Such a course of events is quite typical, and may be regarded as definite evidence that a pneumoperitoneum has been produced. This may be confirmed by x-ray, a plate taken after insufflation being compared with a control-plate

taken before. The x-ray should be taken with the head of the table slightly raised; in that position the intra-abdominal gas rises, and even a small collection is demonstrable as a subdiaphragmatic pneumoperitoneum.

When both tubes are occluded, the pressure in the apparatus does not show the typical drop, even though it is raised to one hundred and fifty or two hundred millimeters. No general abdominal discomfort is felt, but some dull pelvic pain may be caused. X-ray will, of course, show no gas in the abdomen.

If a pneumoperitoneum can be thus produced, it is positive proof that at least one tube is patent. No assurance is given that both are open, and nothing is learned by this method about the condition of the ciliated epithelium or the musculature of the patent tube.

If no gas can be insufflated into the abdomen, the presumption is that both tubes are occluded. In one case of mine, however, where insufflation done on three separate occasions failed to produce a pneumoperitoneum, laparotomy showed no organic occlusion, but merely a long mesosalpinx, which had apparently allowed the tube to kink under pressure of the entering gas.

Granting that the fact of occlusion is established, we are still without information as to the location and extent of the tubal damage. Evidence upon these points may be obtained from an x-ray taken after the injection of collargol or other radio-opaque substance.

It has been suggested that the technique just described involves two dangers—the possibility of producing gas-embolism, and the risk of forcing septic material into the peritoneal cavity. With the use of oxygen or carbon dioxide the first danger is remote, as these gases are rapidly taken up by the corpuscles if they get into the blood stream. As to the second possibility, there seems to be little likelihood of driving uterine secretions up through the tubes, since only a gentle gas-flow is used. The chronic tubal infections are usually sealed off, and in acute conditions one would naturally not think of using this technique.

Transuterine insufflation was designed primarily as a diagnostic method. As such it has definite value, though care must be exercised in interpreting the results obtained. It has also, I believe, a place in therapeutics, as a post-operative measure for maintaining during the period of healing the patency of tubes upon which a plastic reconstruction has been done.

The ovarian sterilitites form a considerable group, about which our knowledge is as yet very incomplete. Much work remains to be done on what might be termed the minor pathology of the ovary, particularly its functional pathology. It seems certain that abnormal conditions which produce no symptoms of disease may be quite sufficient to prevent normal ovulation. It is of course not possible to study ova as we do spermatozoa, and hence our direct observations along these lines have necessarily been confined to

ovarian conditions found at operation or autopsy. Nevertheless some information can be obtained from a careful history, in combination with rectovaginal-abdominal examination under anaesthesia, this preferably made both during and between periods of menstrual congestion.

The disorders which interfere with the production of normal ova may be grouped under four headings, as constitutional, toxic, endocrine, and mechanical. This is a useful working classification, although in practice some overlapping of the groups often occurs.

Constitutional conditions include malnutrition, anaemia, and cachexia, by whatever cause produced, as well as the results of faulty diet and faulty general hygiene. That such factors have a deleterious effect on the male sex-cells is capable of definite demonstration, and it is reasonable to assume that the female cells may suffer in a similar way. Every stock-breeder knows that poorly nourished and ill-conditioned animals are likely to exhibit lowered fertility, if not absolute sterility. Whether the trouble lies in a diminution in the number of ova produced, or merely in a defect in their capacity for reproduction, the result is the same.

Of toxic conditions which affect the ovary a few examples will suffice. Severe morphinism or alcoholism are known to inhibit both menstruation and ovulation. An occasional sterility has been traced to auto-intoxication from intestinal stasis. The occurrence of absolutely sterile marriages among syphilis is given by Solomon as twenty-three per cent., as opposed to ten per cent. among the population at large. Whether mumps can affect the germ-cells of the ovary as it occasionally does those of the testis, I do not know. Here again the deficiency may be in the quantity of the ova, in their quality, or in both together.

Endocrine sterilities fall generally into two groups—those cases where complete sexual development has never occurred, and those others who exhibit a premature waning of normal sexual activity. Both states are common; the latter group provides a familiar clinical picture. In it we find the woman who begins to take on weight in her later twenties, to become irregular and scanty in her menstruation, and to lose what little sexual appetite she may once have had. The relation between obesity and sterility has long been noted, but the older writers fell into the error of thinking that the obesity was the cause of sterility, whereas it is really a concomitant result, both arising from a much deeper cause. Organotherapy with whole ovary and thyroid will usually reduce weight somewhat and relieve menopausal symptoms, but it is likely to be disappointing in the treatment of sterility.

Mechanical factors that interfere with ovulation do so mainly by producing an increased intra-ovarian tension, which acts directly to prevent the full development of the Graafian follicle and the discharge of the ovum. When one con-

siders the anatomic vicissitudes through which the female sex-cell passes in the process of maturation, the wonder is that even one oögonium in fifty successful completes that process. Under conditions that are only slightly abnormal that one cell may easily share the fate of the other forty-nine. Thus sterility is often found in patients whose ovaries contain multiple small follicular cysts, or persistent cystic corpora lutea. A thickened tunica albuginea may be responsible in some cases, as may also old inflammatory adhesions. Both dysmenorrhoea and sterility, when due to such conditions, are frequently relieved by a properly chosen operation.

There is a small but definite group of cases where the most painstaking investigation reveals no abnormality in either husband or wife. These are the cases of so-called mismatching, incompatibility, or idiopathic sterility. No reason can be found why either party should be sterile, and yet the union is fruitless. It has occasionally happened that such a couple have separated, each has remarried, and each has had children by the new mate. I know of one such case personally. For every one occasion where this sequence has worked itself out and has gone on record, the possibility of it must be present in hundreds of cases. What is the factor which is to be charged up, not against either individual, but against the mating? In connection with blood-grouping we have learned that in two persons picked haphazard there is a fair chance that the serum of one will cytolyze the red blood corpuscles of the other. Insemination is analogous to blood-transfusion in so far as we expect the cells of one individual to live and flourish in an environment of the tissue fluids of another. There is an idea of long standing that the woman absorbs certain elements of the seminal fluid; if that is so, she has surely abundant opportunity to become sensitized against spermatozoa.

I have been much interested in the possibility of a cytolytic factor in sterility, but I hesitate to present this phase of the subject, because my evidence is not yet sufficient to support definitely any conclusions, and so the idea smacks rather of arm-chair reasoning. I have seen five cases which appeared to belong in this class. One of these disappeared from observation, so that four only were completely studied. It was thought at first that a comparison of the blood-groups of a couple might serve as an index of their general serological relation to each other. The data of Moss, however, show that this is not true as regards a possible spermatolysis, since marriages between individuals with hostile blood-groups are as fruitful as other matings. Accordingly, in the four cases just mentioned the wife's blood-serum was tested directly against the seminal fluid of the husband. In two of these cases prompt loss of motility and definite agglutination of the spermatozoa occurred. In the other two no appreciable change was produced in the semen by the addition of the serum. Before any conclusions can be reached on this subject, we must

have a much more extensive series of observations, including controls on non-sterile patients.

As one reviews the literature of sterility, it is a striking fact that large contributions have been made by two groups of people who are not physicians. The first of these are the pure biologists and the second the stock-breeders and veterinarians. We can take certain leaves from the book of each group. Particularly interesting are such observations as those made by Cuénot and by Castle and Little on yellow mice. These mice are an impure strain carrying yellow as a dominant and black as a recessive color-characteristic. According to Mendelian expectations of four offspring from such parents one should be pure black, one pure yellow, and two mixed, these last actually being yellow, since that characteristic is dominant over the recessive black. As a matter of fact, the offspring were correctly proportioned as regarded the pure blacks and the mixed, but the pure yellows never appeared. Little found that these missing offspring actually started to develop, but were invariably blighted at an early period of embryonic life. The reason appears to be that there are certain hereditary qualities capable of transmission according to Mendel's law, which are in their very nature inimical to the development of an embryo which carries them. Such a lethal factor, so called, is associated with these mice with the yellow color-characteristic. Morgan, working on the fly *Drosophila*, has produced a strain of which two members mated together are always sterile, while either a male or a female of the strain in question is fertile if mated with a partner of another strain.

Whether similar lethal factors exist in the human must be a matter of speculation, but their operation might account for an occasional case of apparently inexplicable sterility. Hühner has noted that the parents of his sterile patients had on the average families as large as did other couples of the same station and circumstances. No conclusions can be drawn from such an observation, however, since the majority of his patients were sterile for reasons which had obviously nothing to do with heredity. This phase of the subject is of purely academic interest, for diagnosis cannot be definite, and treatment is out of the question. At least here is a loophole for the unwary medical student who is trapped by the old joke about sterility being hereditary.

In the Bible eight cases of sterility are recorded. In each case it required a divine miracle to bring about a cure. We have improved somewhat in our mortal ability to handle this condition since the days of old, but nevertheless our results, taken as a whole, must be regarded as unsatisfactory. The problem is a complicated one; the solution in each case is well locked up, and the curette is by no means a skeleton key. Improvement in these results will come with a more careful study of individual cases, and a more accurate knowledge of the aetiological factors involved.

AN INSTRUMENT FOR SUCTION, MEDICATION AND MASSAGE OF TONSILS, AND WITH USES IN GENERAL MEDICINE.

JAMES TAYLOR, JR., M.D., WORCESTER, MASS.

SUCTION, medication, and massage of tonsils are rightly taking an important place in the physician's armamentarium.

An instrument to fulfill these forms of treatment must have: (1) The right form to enter the mouth, to act as a tongue depressor, to fit the tonsil, and to hold the application without weakening the air current, or allowing the medicated wool to be lost in the mouth. (2) A trap for secretion. (3) Not only an efficient, but also a mobile force readily controlled, to save pain, discomfort, and laceration of tonsillar and pillar structures. (4) Made of material which is resistant to heat and ordinary usage, and readily sterilized.

In practice these factors have been proved in the present instrument.

First. Remembering that in the movement of a fluid, friction increases with the decreased caliber of its container, the shape of the instrument was so made as to give the maximum of action in its air column when force was applied. For this reason a trumpet form body with wide tubing is used, and shaped to the size of the average tonsil.

Second. Medicated lamb's wool may be inserted, and when the instrument is fitted to tonsil with valve partly or entirely closed, and force is applied, it will bring the medication against the tonsil. On the release of pressure, the wool retreats into chamber. This method may be used when the physician wishes to "flood" the tonsil. Wool saturated with witch hazel solution or cooking soda solution is sufficient.

Third. The trap which prevents infection to bulb and does not interfere with its action. No tissue gives such quick reaction to suction as the tonsil, and a surprise awaits the novice in the amount of secretion which may be drawn from its crypts.

Fourth. Essentially, glass is of primary importance as material in such an instrument. So Pyrex glass is used. This is resistant to heat, readily sterilized, and will stand rough usage.

Fifth. No more efficient and mobile force for operation of this instrument can be found than the bulb and valve suggested in the BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. 185, No. 13, pp. 381-386.

While this instrument was designed especially for the tonsils, it has many uses in general medicine. It forms a handy and effective method of clearing mucus from throat in anesthesia, pus from wounds, depressed nipples, as a breast pump, etc.

AN INVESTIGATION OF THE RELIABILITY OF LABORATORY TESTS AND A DISCUSSION OF TECHNIQUE OF LABORATORIES IN AND NEAR BOSTON.

(Continued from page 506.)

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PART 4.

Technique for Health Department Diagnostic Tests.—These notes on technique are simply the expression of opinion of the majority of those engaged in the comparative tests previously reported. Several conferences of these workers were held for discussion of the results obtained and for the adoption of more uniform procedures. No claim is made for originality.

DIPHThERIA.

Staining—Loeffler's alkaline methylene blue is recommended for routine work. Slides should be cold and stain applied for not more than one-half minute. Kinyoun's stain is also recommended; slides cold, stain applied two minutes.

Stains: *Loeffler's Alkaline Methylene Blue.*

Stock sol.: Methylene blue, 1 part; 95 per cent. alcohol, 10 parts.

Stain: Stock sol. 300 c.c. 1-10,000, KOH 1000 c.c.

KINYOUN'S STAIN.

Toluidin Blue	0.5 gr.
Azur II	0.05 gr.
Meth. Blue	0.05 gr.
Alcohol (95%)	25.00 c.c.
Acetic (glacial)	1.00 c.c.
Distilled water to	600.00 c.c.

Dissolve stains in alcohol, add water, add acetic last.

Since some of the laboratories are experimenting with Dr. Albert's stain, the formula is given here, and other laboratories are asked to compare it with the stain in regular use. This applies also to Dr. Kinyoun's stain. It is urged, however, that no new stain, however good, be adopted for routine work until the technician has become thoroughly familiar with it through a long series of comparisons with the stain to which he is accustomed.

ALBERT'S STAIN.

Solution 1.

Toluidin Blue	0.15 gm.
Methyl green	0.20 gm.
Acetic acid (glacial)	1.00 c.c.
Alcohol (95%)	2.00 c.c.
Water (distilled)	100.00 c.c.

After standing for one day, the solution is filtered and is ready for use.

Solution 2.

Iodin	2 gm.
Potassium iodid	3 gm.
Water (distilled)	300 c.c.

The solution is ready for use as soon as the iodine is dissolved entirely. The directions given by Dr. Albert are as follows: "Smears are made on slides or cover-glasses; fixed by heat; stained with Solution I for one minute; washed with water; dried with good absorbent filter paper; stained with Solution II for one minute; washed and dried with filter paper. The granules of the diphtheria bacillus are stained black, the bars dark green and the intermediate portions a light green. Virtually all other bacteria also take a light green stain."

Diagnosis.—Except in diagnosis of young cultures diagnosis should be made only on A, C and D types "Wesbrook."

When other of the major forms are present, as A1, A2, B, B1, B2, C1 or C2, but no granules can be demonstrated, a report of "suspicious" should be made and another culture requested. Forms lower in the scale than D may be disregarded. Typical grouping and irregularity of form shall also be considered, but diagnosis should not be made on these points unsupported by the finding of granules. These rules apply also to swab examinations.

In examinations of young cultures the so-called clove-forms with unstained sputum

and without granules are diagnostic.

An assistant should not be permitted to give an independent report on cultures without proven ability and should also have at least six months' training in routine work in a laboratory handling many cultures. For reports on swabs and young cultures the training should extend over at least a year. When two or more diagnosticians are available, reports should be made as agreed upon by two.

Medium.—Loeffler's blood serum. (Horse, beef or pig serum may be used.)

Incubation.—Fourteen or 15 hours at 37° C. is recommended. For the examination of young cultures five hours' incubation or over, the cultures may be removed but should be replaced for the full period of incubation, and examination made again.

Smears.—Smears should be made representative of the whole growth and obtained by rubbing the platinum loop over the whole surface of the serum.

The material thus obtained should be rubbed, with a drop of fresh tap water, in a thin smear over a glass slide, the smear covering an area of at least 1 inch by one-half inch.

A number of such smears on a large glass slide is allowable, provided care is taken to separate the preparations with wax pencil marks and not to allow spattering from one preparation to another.

Cultures which show liquefaction or sufficient contamination to prevent a diagnosis, or which are excessively dry, shall not be considered satisfactory for examination if the result is negative.

Reports.—The reports of the examination shall be:

1. Diphtheria bacilli found.
2. Diphtheria bacilli not found.
3. Culture contains suspicious forms.

When suspicious forms are found a swab preparation shall be examined, if this has not been done. The culture shall also be reinoculated on fresh media and reincubated for further study.

4. Culture unsatisfactory, contaminated or dry. In the latter two cases, 3 and 4, another culture shall be requested. Another culture shall also be requested when the result of the examination is negative, if the physician's diagnosis is diphtheria, or if it is stated that the inflammatory reaction is in the larynx.

The organisms associated with Vincent's angina, as found in swab examinations, or the unusual predominance of streptococci either in swabs or culture, shall be reported when found.

If there is a suspicion of Vincent's angina a swab preparation stained deeply with methylene blue shall be made.

Virulence Tests.—Virulence tests on all clinical cases shall be run on request, provided the patient has been quarantined three weeks or over. The State laboratory prefers a period of six weeks' quarantine.

Virulence tests may be made when typical morphological organisms are found and the patient has shown no symptoms of the disease. For the virulence test three or more colonies of the organism shall be isolated and grown in bouillon, + 1 Fuller's scale, for either twenty-four or forty-eight hours. Do not filter. A day's time may frequently be saved in giving a positive virulence report by use of the twenty-four-hour culture. The culture should, however, be further incubated and if the results of the first inoculation are negative after twenty-four hours, a second pig should be inoculated with the forty-eight-hour culture. A control animal inoculated with the same dosage of toxin, but protected with antitoxin, may be used if desired. For dosage use one-half of one per cent. of the body weight of the guinea-pig, injecting subcutaneously in the abdominal wall. Report positive on death of the guinea-pig or if there is any marked inflammatory reaction in twenty-four hours or more and if autopsy shows marked inflammation of the supra-renal capsules. A negative report shall not be made until at least forty-eight hours after the inoculation.

TUBERCULOSIS.

Rules agreed upon are as follows:

Specimens shall be accepted only in outfits provided by the laboratory.

Specimens which have leaked or run over the sides of the container will not be accepted.

Container should have at least one-fourth volume of an efficient disinfectant.

The outside of the container, box, slip, etc., should be disinfected after receipt at the laboratory.

Sputum should be prepared for examination by shaking, digesting with antiformin, or by a combination of both these processes.

Smears should be at least one inch by one-half inch in area.

For staining, Ziehl's carbol-fuchsin is recommended, applied for five minutes steaming; decolorize with alcohol (denatured or 70 per cent. grain) containing 3 per cent. hydrochloric acid. Other accepted decolorizing agents may be used if preferred. Counterstain with methylene blue.

A positive sputum shall be used as a control. The absence of tubercle bacilli shall be reported only after the specimen has been examined for at least five minutes.

A positive diagnosis shall not be made unless at least ten acid-fast bacilli are found, or unless the bacilli are found in two preparations.

Sputum containers shall be used but once and destroyed.

Slides or centrifuge tubes, if used, shall be cleansed by immersion in sulphuric acid and potassium bichromate for at least twenty-four hours before being used again.

In the examination for tubercle bacilli of specimens other than sputum, such as urine or pus, the finding of acid-fast organisms, or their absence, shall not be considered sufficient evidence for diagnosis, but guinea-pig inoculations shall be made.

Guinea-pig inoculations are made by subcutaneous inoculation of the suspected material in the abdominal wall. The animal should be kept six weeks under observation, then chloroformed and autopsied, a positive diagnosis being made on finding the bacilli in the inguinal glands, spleen or other glands or organs. Animals may be autopsied earlier if enlarged glands are present.

Technique, Widal Test.—Specimens of dried blood which are used in making the agglutination test shall be diluted approximately 1:25 with water or physiological salt solution.

A motile culture of the typhoid bacillus in bouillon which agglutinates readily with positive serum shall be used for the test.

This bouillon culture should be made from a stock agar culture which has been attenuated by storage, for about one month, on ice.

The stock agar culture is kept by transplants from agar to agar.

The bouillon culture should be incubated at a temperature between 20° C. and 37° C. for not more than eighteen hours. The culture shall not be disturbed, and only the surface shall be used for the test; or if the growth is too heavy it may be diluted to correspond to a turbidity standard.

One loop of this culture and one loop of the 1:25 dilution of blood are mixed on a cover-

glass, and a hanging-drop preparation is made which should be examined at once, and again after one hour. A hanging-drop of the culture alone should also be made and used as a control.

The diagnosis of typhoid fever shall be made on complete agglutination and loss of motility in one hour. If the reaction is partial, it should be so reported and another specimen requested.

Positive results on specimens from vaccinated persons are unreliable.

Repeated macroscopic tests, for observation of change in the agglutination titre, are recommended for the diagnosis of typhoid fever in those who have been vaccinated.

GONORRHOEA.

Technique.—Smears are stained by Gram's method, and the diagnosis is made on the presence of gram-negative intracellular diplococci of typical shape and grouping in the pus cells.

In chronic cases a positive finding may be made on the presence of typical organisms in shreds or in epithelial cells.

In any case where such organisms are found the report shall be "Gram-negative, intracellular diplococci present."

Stains, Sterling's Method.—Two c.c. anilin oil + 10 c.c. 95 per cent. alcohol. Shake and add 88 c.c. distilled water.

Five grams of gentian violet are ground in a mortar and the anilin solution added slowly while grinding. Filter.

Directions for Staining.—Sterling's solution of gentian violet, cold, one-half to one minute. Wash. Gram's iodine solution, one minute. Wash. Decolorize with alcohol. Wash. Counterstain with bismarck brown, weak carbol-fuchsin, 2 per cent. aqueous pyronin or other weak solution of a contrasting dye.

Carbol Gentian Violet.—Saturated alcoholic solution of gentian violet, 90 c.c. Five per cent. phenol in water, 1000 c.c. This stain keeps well, but is not as permanent as Sterling's.

WEIGERT'S METHYL VIOLET

Solution 1. Absolute Alcohol, 33.
Aniline oil, 9.
Methyl violet in excess.

Solution 2. Saturated aqueous solution of methyl violet.

The staining solution consists of:

Solution 1. 1 part.
Solution 2. 9 parts.

This mixture will keep at the most for four-tenths days.

Burke's Stain (Jour. A. M. A., September 24, 1921). 1. Flood slide with anilin gentian violet or a 1 per cent. solution of aqueous solution of methyl violet. Thoroughly mix with the dye on the slide a few drops, three to eight, depending on the amount of dye, of a 5 per cent. solution of sodium bicarbonate. Allow to stand for two or three minutes.

2. Flush off the excess stain with iodine solution (1 gm. of iodine, 2 gm. of potassium

iodide and 100 c.c. of distilled water) and cover with fresh iodine solution and allow to stand one minute or longer.

3. Wash in water as long as desired and blot off all free water until the surface of the film is practically free of water, but do not allow the film to become dry. The success of the stain depends largely on the proper control of this step.

4. Decolorize with acetone or acetone and ether (one part of ether to from one to three parts of acetone) until the acetone flows from the slide practically uncolored. This usually requires less than ten seconds. The acetone should be placed on the slide. The slide should not be dipped in the decolorizer.

5. Blot dry. The slide quickly dries without blotting.

6. Counterstain for five or ten seconds with a 2 per cent. aqueous solution of safranin O. Exposure to the counterstain can be increased, depending on the excellence of the violet dye used.

7. Wash off excess stain by short exposure to water; blot and dry.

8. Immerse in xylene or turpentine for several minutes, or until clear. Examine.

Technique of Wassermann Test.—For discussion of the Wassermann work as a whole, including all the comparative tests done, it was found difficult to arrange meetings suited to the time of all the participants. Those who were able to be present at these discussions agreed on the use of the technique advised by the State Wassermann Laboratories, using sheep-cells, anti-sheep cell amboceptor and for complement guinea-pig serum.

The reagents are to be prepared and standardized in accordance with the technique of the State Laboratory (*American Journal of Syphilis*, October, 1920).

Minor differences in technique seem to be unavoidable. The exact volume of the test is not important, the majority preferring a volume of 2.1 c.c.

While pooled serums from several guinea-pigs is advised for complement, there is no objection to the use of serum from a single pig, provided it titres correctly.

It is advisable while complement is out of the ice chest, during the tests, to keep it cold by placing it in an iced receptacle.

It is advised that laboratories using the State antigen control it with at least two others, either two cholesterinized antigens of different strength or one cholesterinized and one acetone insoluble antigen. When an acetone insoluble antigen is used the dosage of serum should be .4 c.c. and a control should be run with an equal amount.

No antigen should be used in quantity exceeding one-fourth of the anticomplementary dosage.

The method of dilution of an antigen is of great importance, and differences in the tech-

nique in this dilution may account for false end-results in the test.

In diluting the State antigen the salt solution should be added through a special pipette, prepared to deliver slowly, until a quantity equal to the amount of antigen has been added, after which the amount necessary to complete the dilution is added as quickly as possible. During the first part of the process the mixture is constantly agitated.

It has been promised that as soon as possible a State antigen will be provided with sufficient antigenic power to allow a larger anticomplementary margin, and that accurate antigen dilution pipettes, with directions for their use, will be furnished each laboratory using the State technique.

In reporting results the following terms shall be used: "Positive," "Negative," "Doubtful," "Unsatisfactory." If desired, a positive report may be further characterized as strongly, moderately or weakly positive. Explanation of an "Unsatisfactory" report may be given as "Anticomplementary," "Hemolysed" or "Bacterially contaminated."

DISCUSSION.

In discussing the whole investigation, the writer wishes to express his appreciation of the cordial coöperation of all the laboratories represented and the great interest shown in the comparative tests. Much would be gained in accuracy by the uniform adoption of standard procedures; that is to say, by an agreement to adopt the best methods.

There is a tendency in any laboratory doing routine work to get into a rut, so to speak, and to lose tone. A series of comparative tests awakens the interest and stirs the worker to a careful observance of his technique. Errors in technique which may have been long unrecognized are revealed and corrected and the conferences of technicians from various laboratories tend to introduce more generally improved technical methods. In the Wassermann work the tests with serums from cases in which the clinical history is compared with the findings has been especially helpful in showing the value of the reactions. Accuracy in laboratory tests is indispensable, and it would be of great benefit in this regard if some arrangement could be made for a constant check or control on diagnostic work, either by the submitting of specimens for comparative tests, by submitting, without the knowledge of the technician, known positives or negatives, or by observing the technique and checking the regular routine.

The smaller laboratories labor under a serious handicap, since they deal with but few specimens, and, because of lack of practice, may make erroneous returns. A false negative on a case of diphtheria or a false positive on a Wassermann may, either one, mean serious trouble. If city laboratories where technicians must pass civil service examinations are not free from

error, what shall be said of private laboratories, which are under no restrictions?

Would it not be a good plan to require that all persons who assume the responsibility of reporting on diagnostic tests should pass an adequate examination and should display certificates in their laboratories?

For oversight of the technique of smaller laboratories and for help in their problems a number of towns and cities might associate in the employment of an expert, or such a person might be engaged by some central authority, and his services given to those laboratories requesting the same; his duties to consist in visiting the various laboratories, observing the technique, advising or suggesting improvements, and checking the diagnoses given, to study new technique and to introduce improved methods, to report any marked inefficiency, and in time of emergency, as in an epidemic, to supplement the work of the regular technicians.

Those engaged in the bacterial examination of milk, which is conceded by most public health authorities to be much more important than the chemical tests, should be required to pass examination before a duly qualified board of examiners and should have their laboratories visited and their technique checked, as is now required for those doing the Babcock test.

Private laboratories offering services in diagnosis tests should also come under sufficient expert supervision to safeguard the public.

The diagnostic laboratory has been of incalculable service, and its importance will increase rather than decrease in the years to come. It is to the advantage of all concerned that all such laboratories be maintained at a high point of efficiency.

CONCLUSIONS.

The best approved methods should be agreed upon and adopted as standards by all diagnostic laboratories.

Those engaged in laboratory diagnostic work should have adequate training and should be of proved ability.

Some method of supervision or of mutual association of diagnosticians should be devised to insure the use of uniform technique and as a control on the accuracy of the work.

BONE SARCOMA; PREVALENCE IN MASSACHUSETTS.

By E. A. CODMAN, M.D., BOSTON.

THIS article is in a measure a continuation of that in the issue of this Journal for August 10, 1922, entitled:—"The Registry of Bone Sarcoma and Medial Human Nature."

Although somewhat less than one-half of the physicians of this State have sent in statements that they do not know of a case of bone sarcoma at present living in Massachusetts, it may be

taken for granted that the great majority of living cases would have been brought to our attention. By checking in the Directory the names of those physicians who have replied we have found the names of those who have not replied and have obtained a fair idea of whether some of the individuals would be likely to know of a case of this disease. We can thus reduce the probability that other cases have escaped our notice. For instance, there are many specialists, many alienists, many doctors doing official work, many virtually retired, etc., whom we can practically cross off the list as negative. In the smaller towns if several physicians replied negatively, we may be fairly sure that no such case is being treated by the other physicians in those towns. Since we know about the cases in most of the large hospitals we may cross off the names of the members of their staffs who have not replied. There are other reasons which it is needless to go into to complete the argument that we think we have let every physician in the State know that we want to hear about every case of Bone Sarcoma, and that we have now located most of the cases.

In the previous article I stated that there were 71 possible cases located. Further investigation has reduced this to only nine, although we have not yet finished our search. If we should include giant-cell tumors, which are still erroneously called sarcomas, there would be at least 22 more.

In other words, the diagnosis of bone sarcoma is frequently made on insufficient evidence. Cases of osteitis fibrosa, syphilis, non-suppurative osteomyelitis, metastatic cancer, myositis ossificans, and ordinary callus are the common causes of confusion. It appears that the diagnosis of a supposed case of bone sarcoma is usually an error and that the patient probably either has a metastatic malignant tumor or a benign disease. Obviously to the individual this is a most important distinction.

There are four practical points brought out by the investigation thus far:

1. That the diagnosis should be made with great caution.

2. That Bloodgood's claim of the benign character of giant-cell tumors (erroneously called sarcoma) is confirmed by experience in Massachusetts.

3. That true osteogenic sarcoma is almost always fatal (the rare exceptions being cases where early amputation is performed).

4. That since only nine living cases could be located in a population of 4,000,000 there are probably only 225 in the whole United States (100,000,000). It certainly is not likely that there are more than double this number at any rate.

This fourth point is of great value to our Committee and will enable us to plan our campaign to study the disease in other States. I wish now to express our sincere thanks to those

who took the trouble to answer the return postal card.

Another point of considerable interest has been brought out. This is the frequency with which amputation has been performed for giant-cell tumor. It should be possible by early diagnosis and complete local excision to save the limb in all such cases. No metastasis need be feared. However, early diagnosis is not an easy matter. Even if the surgeon excises tissue, the pathologist must have had special experience with these tumors and even then is occasionally in doubt. I think that Doctors Mallory, Wright and Wolbach, who have been kind enough to go over the Registry Collection of over 200 cases of supposed sarcoma, will all admit that seeing a large number of these tumors consecutively, has crystallized their ideas of the microscopic appearances so that errors will be less frequent in the future.

Even when the diagnosis of giant-cell tumor is quite certain, there will be found occasions when amputation is the wisest course, for the bone may be destroyed to such an extent as to appear incapable of regeneration sufficient for functional use. This conclusion must be made with caution, however, for it is surprising how in certain cases after x-ray treatment the bone has regenerated.

The Registry has a few cases in which x-ray treatment without help from operation has apparently been effective. It is clear that logically the x-ray may be used in a suspected bone tumor, on the ground that surgery has little chance if the tumor is metastatic or a sarcoma, and delay will do no harm if the lesion is benign. This is perhaps better reasoning than to cut off all the arms and legs on the ground that now and then a life will be saved, for we only know of six five-year cures in the whole United States.

In the individual case these alternatives will continue to present themselves. The Registry Collection is at the disposal of anyone who is confronted by this dilemma. Those who wish to study the Collection so as to be fore-armed should do so before the meeting of the College in October, because after that it is to be sent about to other cities for the opinions of other pathologists.

If there are other cases now in Massachusetts we should be very grateful for their registration.

In order to save trouble for anyone who may wish to notify us of a case, I present the following notes about the cases which are already registered in Massachusetts.

OSTEOGENIC SARCOMAS.

There are only 9 true malignant osteogenic sarcomas now known to be living.

The 1st (femur), registered by Dr. E. C. Cutler from the Peter Bent Brigham Hospital, has at present metastases in the lungs.

The 2nd (tibia), registered by Dr. J. C. Hubbard, is living and well over 5 years after amputation.

The 3rd, a female of 28, whose thigh was amputated at the Massachusetts General in 1918, has had a recurrence in the stump and the thigh has been re-amputated.

The 4th (fibula), registered by Dr. C. G. Mixer, had an amputation of the leg at the Lynn Hospital in December, 1921.

The 5th (femur), registered by Dr. Robert Slater, refused amputation and is under treatment at the Huntington Hospital with intensive x-ray.

The 6th (humerus), reported by Dr. Anthony of Haverhill, had an amputation of the arm in May, 1922.

The 7th, a male of 38, had an amputation of the femur at the Massachusetts General in November, 1921.

The 8th, a girl of 12, had an amputation of the humerus at the Massachusetts General 2 years ago, and has remained well. There is, however, some doubt as to the pathological diagnosis.

The 9th, was in the mid-humerus in a man of 30. The arm was amputated at the Huntington Hospital in January, 1922.

There was one other doubtful case reported by Dr. E. W. Burt of New Bedford in a woman of 57. In this case we have no evidence that the tumor arose in bone.

It will be seen that with the single exception of Dr. Hubbard's case all are recent ones.

GIANT-CELL TUMORS.

The giant-cell tumor cases known to be living number 22. Twelve of these cases were reported by Greenough, Simmons and Harmer in the *Journal of Orthopedic Surgery*, Vol. 3, No. 11, pages 602-637, November, 1921, from the Massachusetts General and Huntington Clinics. Besides there are the following:

One, reported by Dr. R. W. Lovett, whose arm was amputated for an enormous giant-cell tumor of the ulna in 1908.

One in the humerus was operated on at the Lynn Hospital in February, 1921.

One in the lower end of the radius is registered by Dr. P. D. Wilson.

One in the spine registered by Dr. W. J. Mixer.

One in the tibia, in a woman of 27, was operated on in Worcester and has been registered by Dr. J. E. Goldthwait.

A girl of 15, with a tumor in the lower end of the femur, was operated on in the Mercy Hospital in Springfield in 1920.

One in the lower end of the femur was registered by Dr. H. F. Newhall of Lynn.

One in a finger was registered by Dr. H. J. Maynard.

One in the lower end of the tibia was operated on at the Peter Bent Brigham Hospital in June, 1922.

One in the lower end of the femur has been registered by Dr. J. S. Stone.

We know of a few more giant-cell tumor cases which have not yet been registered. The importance of registering and following up these giant-cell tumor cases is very great, because there are exceptions to all rules, and it may be that metastases may be observed in some of these cases. As yet, however, no case has come to the attention of the Registry which was clearly a giant-cell tumor and has shown metastasis. Local recurrence after incomplete curetting is very common, however.

It is quite as important to register cases which refuse operation and are treated by x-ray, radium, Coley serum, etc., as it is to report operated cases. If a case is being thus treated in good faith as a possible bone sarcoma, it should certainly be registered. Nearly all the above cases have microscopic evidence, but oftentimes good x-rays are nearly as positive as pathologic slides.

POSTMORTEM RADIOGRAPHY.

BY JAMES A. HONEIJ, M.D., BOSTON.

DURING the war, at the U. S. Hospital No. 16, it became a routine procedure to have radiographs made of every patient who died at that institution. The procedure was of inestimable value for instruction and in completing the records of the case. This was especially true in the cases which came to postmortem examination. It was not only of value to the clinician who had, for instance, followed the course of a chronic and complicated case of tuberculosis which perhaps had succumbed to the intervention of an acute disease, but it was of inestimable value in studying the pathology from a radiographic point of view. In this manner a definite check was had on clinical and radiographic diagnosis and the radiograph itself formed a permanent record of the pathology of the case. It also proved of value as regards statistics and research.

During the influenza epidemic of 1918 and 1919 this procedure was of unusual value and the series of radiographs from the very earliest onset of congestion and slight cardiac dilatation to massive pneumonia, substantiated at autopsy, formed one of the most valuable records we had.

At that time I had a series of plate reductions made, so that I had in my possession prints of radiographs, five by seven inches in size, suitable for filing purposes.

Since then it has occurred to me that a procedure similar, but in greater detail, could be applied to the work of the medical examiner. The importance of recording the exact condition of the body as obtained by radiographic means cannot be overestimated. In cases of violent death the presence, size, and exact position of a foreign body, such as a bullet, can be deter-

mined, together with its relation to important structures. It forms a permanent record. As frequently happens in the necessary handling of a body and organs during an autopsy, the foreign body, a bullet for instance, becomes dislodged and much time is lost and unnecessary speculation indulged in to determine its exact previous position. In the case of a wound from a knife or similar object the direction and exact depth can be easily demonstrated. In cases of fracture due to blows by falls or by violence in any form, no better record can be had.

It is often a difficult matter to determine the presence and extent of a fracture, and frequently in determining these fractures by autopsy a tremendous amount of time is consumed. In the case of multiple fractures, sometimes one or more are overlooked. In the case of skull fractures cause and effect can frequently be demonstrated with great exactness. In this manner a large amount of labor would be saved, a record of pronounced value obtained, and corroborative evidence had which the coroner could use with effect in presenting evidence in court in medico-legal cases.

In cases with a questionable cause of death the presence and extent of a disease such as pulmonary tuberculosis or cardiac disease may under certain circumstances be sufficient to modify autopsy procedure. Or, on the other hand, the absence of these conditions or any other demonstrable condition by means of radiography may be sufficient cause for a complete and thorough autopsy.

These records can be made valuable. If the radiographs are reduced by means of photography to such size, say five to seven inches, which is considered sufficiently large for prints to be made from them and which show clearly enough the necessary demonstrable points, then it forms a very complete record of the case. The use of skeleton charts and photography in autopsy work I am perfectly familiar with and I appreciate their value, but it seems to me they can be made additionally complete and valuable by the use of radiography.

A chart is not always convincing to a jury in medico-legal cases but it may be made more so by the use of radiographs.

Here is a field, apart from its more practical aspects, for research that has not been touched and which, to my mind, may give results which cannot as yet be overestimated.

VETERINARY INSPECTION IN NEW YORK CITY.

A Division of Veterinary Inspection has been organized and made effective August 2, 1922, in the Department of Health of New York City.

This Division embraces and controls the veterinary activities of the Bureaus of Preventable Diseases, Foods and Drugs, and Laboratories.

PUBLIC HEALTH LECTURERS FOR THE YEAR 1922.

The Committee on Public Health of the Massachusetts Medical Society has been able during the past three years to arrange with well known specialists in various medical fields to give talks at meetings of the District Medical Societies on subjects of interest and importance to all practitioners. It is a pleasure to announce that a similar arrangement has been made this year and that the gentlemen named below are willing, without expense to the District Society, to give occasional talks of thirty to forty minutes on subjects relating to the promotion of public health, extending opportunity for questions and discussion. It is suggested that medical societies consider meeting at neighboring public institutions, since such meetings have been most successful in the past, particularly at the tuberculosis sanatoria and state hospitals for the insane.

José Pentado Bill, M.D., Doctor of Public Health, Specialty: Preventive Medicine.

Frank C. Dunbar, M.D., Bacteriologist, Instructor in Bacteriology and Pathology, Tufts College Medical School. "Methods of Technique in Collecting Specimens."

Walter E. Fernald, M.D., Superintendent, Massachusetts School for the Feeble-minded.

Timothy Leary, M.D., Professor of Pathology, Tufts College Medical School; Medical Examiner, Suffolk County.

Edwin H. Place, M.D., Physician-in-Chief, South Department, Boston City Hospital. Specialty: Contagious Diseases.

C. Morton Smith, M.D., Chief of Department of Syphilis, Massachusetts General Hospital.

George Gilbert Smith, M.D., Assistant in Department of Genito-Urinary Diseases, Massachusetts General Hospital. Specialty: Genito-Urinary Diseases.

Lesley H. Spooner, M.D., on Staff of Out-Patient Department, Massachusetts General Hospital, Specialty: Specific Diagnosis and Treatment of Pneumonia.

William C. Woodward, M.D., Ex-Health Commissioner, City of Boston.

George H. Wright, D.M.D., Lecturer on Dental Hygiene, Harvard Dental School. Specialty: Dental Surgery.

Thomas F. Kenney, M.D., Director of School Hygiene, City of Worcester. Specialty: Full time School Health Officer.

Secretaries of District Medical Societies writing to ask for these lecturers will kindly designate the topic, the place and the hour of meeting as well as the name of the desired speaker, thus eliminating unnecessary correspondence. Please address communications to the Secretary of the Committee, Annie Lee Hamilton, M.D., 164 Longwood Ave., Boston 17.

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THE COUNCIL MEETING.

THE large attendance of councilors at the meeting of October fourth demonstrates the interest of the members, for the temptation to take advantage of a beautiful autumn day for out-of-door recreation must have appealed to many.

Before taking up the business of the meeting the President paid tribute to the memory of Dr. William Andrew Dolan of Fall River, whose sudden death was recently announced. Mention was made of the faithful service in the Council for twenty years rendered by Dr. Dolan and his various professional and civic activities in his community.

The Chair announced the appointment of the following named members of the Committee on the Gorgas Memorial to cooperate with the National Committee: Drs. Frederick C. Shattuck, Samuel B. Woodward, Edmund E. Stevens, Fred B. Lund and William H. Robey, Jr.

Dr. A. P. Merrill of Pittsfield responded to the request for information concerning the annual meeting of the Society, which will be held in Pittsfield next June. He assured the members that the local representatives of the Society, in the western part of the State, are pleased to have this opportunity of providing for the entertainment of the Society, and felt confident that ample accommodations would be available. He spoke of the necessity of having an approxi-

mate estimate of the number of attendants and emphasized the desirability of having responses to a postal card request for information. A very general feeling has been expressed that there will be a large attendance at this meeting, and this plan may add much to the usefulness of the Society. The President added a warm endorsement of this plan. The local Committee of Arrangements consists of Drs. A. P. Merrill, B. W. Paddock, J. B. Thomes, C. H. Richardson and J. A. Sullivan.

The President nominated Dr. C. E. Mongan, Chairman, and Dr. Frederick Irving, Secretary, of the New Section on Obstetrics, and the nominations were confirmed by the Council. Under a resolution previously presented to the Council suggesting holding Council meetings in places other than in Boston at various times, the Secretary reported that he had not secured from the officers of the district societies sufficient endorsement of this suggestion to warrant its adoption.

As requested by the Council last June, the Committee on Public Health reported definitions of the terms "Public Health" and "Public Health Nurse." This brought out an animated discussion by Drs. C. E. Mongan and A. H. Quessy. It was not clearly comprehended whether the remarks were in criticism of the definitions submitted or were intended to amplify and clarify the attitude of the profession toward the common understanding of these terms. Dr. E. F. Cody, of the Committee, seemed to infer that there was a feeling of dissatisfaction with the report submitted, and stoutly maintained that the definitions were clear and comprehensive. The subject is a matter of interest and Dr. Mongan's promise of further discussion will be awaited with interest.

The report of the Committee on Membership and Finance was adopted with a few minor changes. The recommendations for the deprivation of membership for non-payment of dues brought several members to their feet with the promise of personal effort in behalf of some delinquents. The question was raised as to the wisdom of accepting the resignation of a Fellow who had seemed to be guilty of unprofessional conduct, and the recommendation of the Committee was modified by a vote referring the status of a certain Fellow to the Committee on Ethics and Discipline with the request for a definite recommendation.

The Committee appointed for the purpose of canvassing the New England States in order to ascertain the attitude of the other State societies toward the formation of a New England Medical Society reported that there seems to be a strong sentiment in favor of this plan and it was voted to instruct the Committee to continue the functions delegated to it.

According to the opinion rendered by the legal counsel of the Society there is no necessity

of changes in the law relating to authority to hold a larger income, for the statutes permit a latitude in excess of any reasonable expectation for all time.

Dr. H. G. Stetson read the report of the delegates to the House of Delegates of the American Medical Association. The comprehensive statement set forth the important matters considered and merited applause followed its presentation.

The technical details of the meeting will be found in the Secretary's report, which will be published soon. The attention shown and careful consideration of all matters presented demonstrates the quality of service given by the councilors and merits the appreciation of the Society.

THE REGISTRY OF BONE SARCOMAS.

Whether we will it or not, we are obliged to be irritated, amused or instructed, according to our temperaments, by Dr. Codman. Our advice is to be instructed. The persistence which has kept Dr. Codman before us in the columns of the JOURNAL has also been the means of accumulating a unique collection of material, including histological preparations, x-ray plates, gross specimens and case histories of bone tumors from all parts of the country. It has required the same persistence to force this material upon the attention of our leading pathologists in New York, Baltimore and Boston, and to extract from them opinions based upon genuine study.

Valuable progress in the clarification of nomenclature and indications for treatment of bone tumors has already been accomplished from the material now at hand. Information of more scientific value is sure to follow. If Dr. Codman has endeavored to pique us into assisting him, after failure with gentler methods, let us forgive him and reflect upon the service he is rendering at a very great sacrifice of time and energy. Personal knowledge enables the writer of this comment to say that Dr. Codman at first, but only at first, found the expert pathologist almost as reluctant to give his time and thought to the material accumulated as was the practitioner to part with his information and material.

The cases of bone sarcoma already collected by Dr. Codman constitute a larger series than most pathologists see in a lifetime. The collection is to be studied by a group of pathologists and surgeons most qualified for this kind of work, and the results of course given to the medical public. All success to the Registry of Bone Sarcomas!

ANIMAL EXPERIMENTATION AND THE PUBLIC.

It is understood that the Officers of the Suffolk District Medical Society are considering

a meeting open to the public to be held during the autumn in Ford hall on a Sunday afternoon.

The subject proposed is a presentation of what animal experimentation has done for scientific medicine and what medicine in turn has done for the benefit of animals.

For a number of years our medical schools have given lectures open to the public, but it has not been the custom for the medical profession as represented by its societies to hold public meetings in what may be termed an open forum.

The medical profession has in a way held itself rather aloof from contact with the public except through the activities of the various committees which are obliged to deal with matters of public concern. These committees would have their position strengthened by a wider knowledge on the part of the public of medical matters. While the purely technical problems of medicine and surgery are not of public interest, there is every reason why the public should be informed on the broader aspects of those matters which concern medical progress.

It is to be hoped that the meeting proposed will be a success. The interest of the physicians and of the public should be great. If this first meeting compares in interest and attendance with the meetings of the College of Surgeons held in Springfield and Portland, the JOURNAL hopes that not only may other meetings be held in Suffolk but that the other district societies will also hold meetings to present the many topics which intimately concern the public. It is a step toward increasing the influence of the medical profession in civic matters.

AN IMPORTANT MEETING.

On the evening of October 18th, Dr. John O. Polak, Professor of Obstetrics and Gynecology in the Long Island College Hospital, will speak at the Boston Medical Library on Caesarean Section. The meeting will be the first of those to be held by the Suffolk District this season, but at all the meetings physicians interested who are not members of the Suffolk District will be welcomed.

It is almost exactly twenty-five years ago that the late Dr. George Haven performed the first Caesarean Sections to be done in this community, unless we consider the rare cases in which the operation was done on a dying mother in the attempt to save her child. Today the operation is almost commonplace in our suburban hospitals. That the operation is not without risk is shown by the mortality rate of about 10% in one of the best of our private hospitals, open only to a selected group of surgeons. It should be recognized, of course, that this mortality rate is due in part to the condition calling for the operation rather than to the operation itself.

That the indications for the operation are not clearly established is shown by the fact that in

two hospitals situated in neighboring cities of the same general character, the proportion of Caesarean Sections to all births is three-tenths of one per cent. in one and is eighteen per cent. in the other. In other words the proportion of Caesarean Sections is over fifty times as great in one hospital as it is in the other.

Dr. Polak is a man of positive views. His paper and the discussion which it will bring out cannot fail to be of interest and profit. He should be greeted by a large audience.

THE HOSPITAL EXECUTIVE.

Of great importance to the hospital and to the community which it serves is the hospital administrator. A study of the duties and relationships of such an officer has been made by the Committee on the Training of Hospital Executives, appointed at a conference called together in 1920 by the Rockefeller Foundation. The Committee's report points out the importance of the hospital as the meeting place in which come together many and varied interests. The health of communities and of individuals comes in touch, through the hospital, with scientific medicine, with medical research, and with medical education.

Progress in medicine is made available for the patient first of all through the medium of hospitals. The hospital executive, therefore, should be able to appreciate the possibilities of new developments in the technique of medicine and surgery, and should be able to view the matter of community health with a breadth of vision which can only be acquired through previous acquaintance with the problems of public health.

The business aspect of hospital administration, as contrasted with the medical aspect, requires training of an entirely different sort. The capital investment involved in the present hospitals of the United States and Canada probably approximates three billion dollars, with an annual maintenance cost of over half a billion dollars. The value received from the expenditure of this sum depends largely upon the business acumen of the hospital executive.

As a means of providing properly trained hospital executives, the Committee advises the establishment of special university courses. The course suggested would consist of nine months' theoretical training, in which might be given courses on Public Health, Social Sciences, Organization, Hospital Functions and History, Business Science, Institutional Management, Personnel Administration, Community Hospital Needs, the Physical Plant, and Jurisprudence. To this theoretical training should be added four months' practical work in a hospital, and two months spent in visiting various institutions. Opportunity should be given to graduates to do research work along lines connected with some phase of the hospital executive's work.

The value of such a course is self-evident. The benefits derived from it would accrue to the advantage of all those classes in the community in whose lives the hospital plays a part.

"Principles of Hospital Administration and the Training of Hospital Executives."—Report of Committee on Same.

THE SCHOOL FOR THE FEEBLE-MINDED AT WALTHAM.

There are many interesting facts in the last Annual Report of the Massachusetts School for the Feeble-minded at Waltham. At this school some sixteen hundred mentally deficient boys and girls are guarded from the impositions and injuries so often inflicted upon such individuals by their mentally more advanced brethren. They are trained to employ to the fullest extent such intelligence as they possess, and are often taught to perform the more simple tasks of the world in so satisfactory a manner that they are enabled to leave the school and earn a fair living.

By the application of intelligence tests, the mental age of each individual is ascertained, and he is set to work in the grade to which his mental age is adapted. A knowledge of the mental age is of value also in predicting the probable adult mental age of the individual. This prediction is based on the "intelligence quotient," which is found by dividing the mental age by the actual age. Thus a child of eight with a mental age of four has an intelligence quotient of 50%; one of twelve years, with a mental age of eight, has 66 per cent. intelligence. By means of a "Prediction Chart" the final development of each case can be forecast with considerable accuracy.

Most of the feeble-minded can be so trained that they live cheerful and, to a certain degree, useful lives. Dr. Fernald, in his report, speaks of the existence of another class—the defective delinquents—whose management is an entirely different matter. He emphasizes the injustice of having these defective delinquents among the feeble-minded, and points out that although a law providing for their separate maintenance has existed for ten years, it has been ignored. The "good" feeble-minded should be allowed to return to their communities; the "bad," or defective delinquents, should be under life-long supervision at an institution.

That the former class can return to the community with safety is borne out by the studies of Miss Mabel A. Matthews, Head Social Worker at Waverley. She found that of 100 boys allowed to leave the School, most of whom had been out between two and three years, only three had been arrested. Of the others, all but two of the adults had been self-supporting; many of them had bank accounts. The work and the wages of

these boys were studied and classified according to the mental age of each. It is encouraging to realize that so much can be done by society for those whom Nature has treated so hardly.

GASOLINE POISONING.

The United States Public Health Service has published an account of a study relating to the effect of inhaled gasoline on a group of workers employed in cancelling coupons. Each worker was exposed to the liberation of 152.4 minims of gasoline per hour. The maximum amount possible to be inhaled amounted to 36.5 per hour, or 255.4 minims in a 7-hour working day. This amount may not have been inhaled because of variation of air currents, but the nature of the work prevented the use of active ventilation, so that the amount inhaled may have been almost equal to the possible maximum. The gasoline was used in cleaning the belts that fed the coupons into the cancelling machine. The gasoline was kept in open containers within 20 inches of the face of each worker, and had to be applied to the feed belts quite constantly. The report gives the effects of gasoline poisoning found among the workers in the following tables:

Symptoms	Male	Female
Headache.....	4	9
Daily headache.....	4	4
Varying headaches.....	0	5
Drowsiness.....	3	8
Afternoon drowsiness.....	2	3
Dizziness.....	3	5
Heaviness in head.....	1	8
Dull aching pain in eyes.....	2	6
Irritated eyes (burning, smarting, or gritty feeling).....	2	10
Excessive lachrymation (watery eyes).....	1	10
Blurred vision.....	0	3
Puffed eyelids.....	0	1
Slight conjunctivitis, one eye.....	1	1
Slight conjunctivitis, both eyes.....	1	2
Impaired taste.....	0	1
Continued hoarseness.....	0	1
Sore and inflamed throat.....	0	4
Constant irritation of throat (tickling or itching).....	0	2
Constant dryness of throat.....	0	4
Extreme nervousness.....	0	3
Feeling of worry.....	0	3
Easily angered.....	0	5
Often easily excited.....	0	5
Complaint of the work being nerve racking.....	2	2
Insomnia.....	0	2
Tingling or crawling sensation of the skin of left arm and fingers.....	0	1
Tingling or crawling sensation of skin on right hand and forearm.....	0	1
Complaint of extreme muscular weakness.....	0	4
Extreme tiredness in the morning.....	3	0
Complaint of gradual loss of use of left forearm, wrist and hand.....	0	1
Exhaustion or "all-in" condition by mid-afternoon.....	0	4
Overtiredness at quitting time.....	0	8
Occasional attack of colic.....	0	2

Symptoms	Male	Female
Nausea (in two cases occurred daily, other cases at various times).....	2	3
Loss of appetite.....	1	6
Constipation.....	0	4
Loss of weight.....	0	1
Frequent urination, condition lasting from a few days to four months.....	2	4

In seeking for substitutes it was found that kerosene of high grade colored with alkanet and deodorized with anise oil could be used to advantage, for the dispensary visits decreased in number and efficiency was increased after this change. It was found impracticable to use alcohol because of its greater cost, and also because of the temptation on the part of the employees to abstract quantities for home use.

The employment of gasoline has become so general that the effects following its use present definite medical problems.

NEWS ITEMS.

Dr. George L. Tobey, Jr., and Dr. Harold G. Tobey, have removed to 270 Commonwealth Ave., Boston, between Fairfield and Gloucester Streets.

WEEK'S DEATH RATE IN BOSTON.—During the week ending Sept. 30, 1922, the number of deaths reported was 199 against 198 last year, with a rate of 13.58. There were 48 deaths under one year of age against 36 last year.

The number of cases of principal reportable diseases were: diphtheria, 57; scarlet fever, 15; measles, 34; whooping cough, 41; typhoid fever, 4; tuberculosis, 30.

Included in the above, were the following cases of non-residents: diphtheria, 3; scarlet fever, 2; measles, 1; whooping cough, 1; tuberculosis, 1.

Total deaths from these diseases were: diphtheria, 1; scarlet fever, 1; measles, 1; whooping cough, 9; tuberculosis, 10.

Included in the above, were the following cases of non-residents: diphtheria, 1; whooping cough, 3; tuberculosis, 1.

VISITING SCIENTISTS.—A group of professors from the University of Strasbourg is in this country in response to an invitation from the Rockefeller Foundation. After visiting the Foundation the larger medical schools of the country will be inspected.

THE LOSS OF THE STRATHCONA.—Dr. Grenfell's mission ship after twenty years of service sank October 2nd, 1922, off the coast of Cabot Island. This disaster calls for substantial interest in the work of the mission. Dr. Grenfell is in Europe. He is expected to deliver two lectures in London.

INVITATION TO DR. JOSEPHINE BAKER.—The Medical Section of the League of Nations has invited Dr. Josephine Baker, Director of the Bureau of Child Hygiene, New York City, to become a member and participate in its deliberations.

BEQUEST TO JOHNS HOPKINS.—By the will of Dr. William S. Halsted, lately professor of surgery in the Johns Hopkins University, the residue of his estate, valued at approximately \$100,000, is left to the university, subject to the payment annually to his widow of five per cent. of the value of the legacy. The bequest is to be devoted to research in medicine, preferably in Surgery.—*Science*, Sept 29, 1922.

Miscellany.

SCHICK TOXIN-ANTITOXIN ACTIVITIES OF BOSTON HEALTH DEPARTMENT TO DATE.

The interest shown and the work conducted by the Boston Health Department in preventive measures, relating to diphtheria, merits the gratitude of the people. The good accomplished may never be fully appreciated by the laity but every blessing conferred by preventive medicine adds to the common welfare. If physicians and nurses will supplement the work done by endorsement and explanation of its certain benefits, many more of the people will realize that the best use of public funds lies in the application of efficient methods conducive to the preservation of health.

Encouragement extended to the Health Department and the Associate Council, will bring dividends of health as well as material prosperity. The JOURNAL congratulates the citizens of Boston on the showing made by the Health Department and is pleased to publish the letter of the Commissioner with the detailed statements.

CITY OF BOSTON.

HEALTH DEPARTMENT.

September 28, 1922.

Boston Medical and Surgical Journal:

Your letter has been received with the request for material in connection with the Schick Toxin-Antitoxin activities of this department, and with much pleasure I am enclosing a brief synopsis of the work done from May 6, 1922, to date.

Very truly yours,

F. X. MAHONEY,
Health Commissioner.

Closely following the plan originated by Dr. Zingher of New York, conferences were held with the heads of the various private institutions of the city which would provide suitable subjects for the test. At these conferences the value of the test and of the immunization which can be offered to those who show a positive reaction

were minutely explained. Appropriate literature and copies of consent slips were given to the parents of the children of these institutions and on May 6, 1922, the actual work was begun.

Naturally the work began on a small scale, but the numbers have increased in a very gratifying manner. To date the work accomplished is as follows:

	Schick Test.	Readings.
St. Gregory's School.....	385	385
St. Vincent's School.....	178	176
East Boston Health Unit.....	1,293	1,181
U. S. Veterans' Hospital No. 41....	342	334
Children's Hospital.....	55	36
Massachusetts General Hospital...	106	44
Carney Hospital.....	6,732	5,841
Long Island Hospital.....	106	101
Blossom Street Health Unit.....	1,596	1,377
Daly Industrial School.....	71	71
St. Anthony's School.....	310	300
St. John's School.....	322	322
House of the Angel Guardian.....	674	633
Little Wanderers' Home.....	78	73
Italian Home.....	37	27
New England Penbody Home.....	47	47
Martin Luther Home.....	27	27
Assumption School.....	402	365
St. Mary's School (East Boston)...	490	464
Sacred Heart School.....	556	489
Fittion School.....	446	406
Totals.....	14,256	12,758

The difference between the number of Schick Tests and the number of readings are the absentees. Therefore 90 per cent. of the Schick Tests done by this department have been read.

The various percentages of the reactions are as follows:

Positive.....	43% (5,276)
Pos. Comb.....	6% (690)
Negative.....	40% (5,135)
Pseudo.....	11% (1,657)

The positive reactors, 5,276, and the positive combined reactors, 690, totalling 5,966, make up the susceptibles to Diphtheria. Of these reactors approximately 80% have been given the first injection; 65% have been given the second injection and 57% have been given the third injection, which is generally the required amount for full immunization.

This department has already made arrangements to Schick and immunize 27,000 Parochial School children in the City of Boston and we hope that our results obtainable at these schools will compare favorably with the work done as noted above.

The Schick Toxin-Antitoxin activities are under the direction of the Epidemiologist of this department, Dr. John A. Ceconi. The staff at the beginning consisted of two, one doctor and one nurse, but the work has progressed so rapidly that the Health Commissioner has seen fit to increase the number to nine—six physicians and three nurses, which constitutes the present working personnel. Three more nurses and two more doctors will shortly be added to the present force.

ESSEX NORTH DISTRICT MEDICAL SOCIETY.

THE quarterly meeting of the Society will be held at the State Infirmary, Tewksbury, Mass. (telephone, Lowell 160), upon invitation of the superintendent, J. H. Nichols, M.D., Wednesday, October 18, 1922, at 2 p. m. sharp, and will be a joint meeting with these district societies: Essex South, Middlesex East and Middlesex North.

From 2 to 3.30 p. m. the Infirmary will be inspected and interesting cases will be shown under the supervision of the superintendent and assistants.

At 3.30 the following will speak:

1. J. W. Bartol, M.D., of Boston, president of the Massachusetts Medical Society (15 minutes).

2. C. F. Painter, M.D., of Boston, chairman Standing Committee on Medical Education and Medical Diplomas, upon "The Importance of the Proper Selection of Members of the State Board of Registration in Medicine" (15 minutes).

3. J. S. Stone, M.D., of Boston, secretary Standing Committee on State and National Legislation, upon "Legislative Matters Concerning Hospitals" (15 minutes).

4. W. P. Bowers, M.D., of Clinton, editor of the BOSTON MEDICAL AND SURGICAL JOURNAL (15 minutes).

5. H. Jackson, M.D., of Boston, upon "Diseases of the Myocardium" (20 minutes).

6. J. H. Nichols, M.D., of Tewksbury, "The State Infirmary" (15 minutes).

All the above topics are open to discussion (3 minutes each).

At the close of the speaking, not later than 5.30, dinner will be served.

The next meeting of the censors will be held at Hotel Bartlett, Haverhill (telephone, 8710), Thursday, November 2, at 2 p. m. sharp.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.

THE first meeting since May of the Norfolk South District Medical Society was held Thursday, October 5, 1922, at the Norfolk County Hospital, Braintree, Mass., and the Society had as its guest President Bartol of the parent society, who talked on the doings of the Council at their last meeting in Boston. All members present were conducted through the hospital by Dr. Roach, the superintendent, who explained the entire workings of the institution. Dr. N. R. Pillsbury read a very good paper on the "Results in Treatment of Advanced Pulmonary Tuberculosis." Statistics taken from all patients admitted to the hospital since its opening were used in the paper. The meetings of this Society are held the first Thursday of the month at the United States Hotel, Boston.

PHYSICAL EXAMINATION OF SCHOOL CHILDREN.

In an article published in the Health Journal of the Massachusetts Tuberculosis League Dr. William H. Devine reports that practically all attendants in the Boston Public Schools have submitted to an annual examination. Reference to the law is made as follows:

"The law requires that children shall be separately and carefully examined every school year, and a written notice of any defect or disability sent to the parent or guardian. (Physicians are required to complete these physical examinations before December first of each year.) The wisdom of this rule is obvious; it admits of prompt and timely treatment.

"All children are weighed and measured at time of physical examination and record of weight and height is made on physical examination record card. Outside wraps, such as coats, sweaters, etc., are removed before weighing. Children from the kindergarten to the sixth grade, inclusive, are stripped to the waist for physical examination.

"In addition to the regular routine examination the school physician examines as often as necessary all children who require it.

"Physical examinations of girls in High, Latin, and Normal schools are made in the presence of the instructor of physical training, the teacher or the matron. Physical examinations of pupils assigned to open-air classes are made in September and re-examination in February.

"A sealed notification of any defect or disability requiring treatment is sent to the parent or guardian of child.

"Special physical examination of candidates for the Normal School are made by the school physicians in January and June preceding graduation from High School. Report on each examination is sent to the Director of Medical Inspection. Applicants for admission to Normal School may be rejected for any of the following causes:

"Communicable diseases, *e.g.*, tuberculosis

"Defective vision

"Defective hearing

"Epilepsy

"Chorea

"Chronic bronchitis or asthma

"Affections that are:

"(a) unsightly, *e.g.*, chronic skin disease

"(b) offensive in nature, *e.g.*, ozena and allied diseases."

It would be interesting to know how the examination of school children throughout the State compares with the work done in Boston.

UNITED STATES CIVIL SERVICE COMMISSION.

Reports that the entire increase in the number of employees in the Federal executive civil

service, both in the District of Columbia and outside, for the period of six years from June 30, 1916, to June 30, 1922, was 122,806.

Obituary.

FRANK FREMONT-SMITH, M. D.

Word has come of the sudden death in Bangor, Me., of Frank Fremont-Smith, September 29, 1922, at the age of sixty-six. He had been suffering with melancholia, a disease which had affected him some five years ago, and he took his life by cutting his throat.

He was a graduate of the Medical Department of the University of Pennsylvania in 1883, had practiced in Philadelphia and, for the last three years in Boston, having also a summer practice at Bar Harbor and a winter practice in Florida, where he has a residence at Winter Park. He resigned from the Massachusetts Medical Society, February 1, 1922, but retained membership in the Maine Medical Association and in the American Medical Association. He is survived by his widow, a daughter and two sons, who are Dr. Maurice and Dr. Frank Fremont-Smith, Jr., of Boston, both fellows of the Massachusetts Medical Society.

RECENT DEATH.

DR. WILLIAM ANDREW DOLAN died suddenly at his home in Fall River, October 1, 1922, aged 64.

The Massachusetts Medical Society.

MEMBERSHIP CHANGES FOR THE MONTH OF SEPTEMBER, 1922.

OFFICIAL LIST (8TH).

Compiled by the Secretary.

ALPHABETICAL LIST.

- Adler, Stuart W., from Boston to Winona, Wisconsin, Winona Clinic.
- Alden, Carmel Rupert, Boston, from 645 Beacon to 497 Beacon St.
- Barnum, Francis G., Brookline, 85 Abbotsford Road.
- Bill, J. Pontendo, Wayland, office Boston, now 144 Commonwealth Ave.
- Blake, Allen H., West Somerville, from 117 Elm St. to 81 College Ave.
- Blanchard, Randall H., Pittsfield, office now 18 Bank Row.
- Cheever, Austin W., Boston, office now 270 Commonwealth Ave.
- Cheley, Glen E., from Roxbury to Denver, Colo., 538 Imperial Bldg.
- Cohen, Samuel Adams, from Boston (Suffolk) to Roxbury (Norfolk), office Boston, 483 Beacon St.
- Crittenden, Samuel W., from Woburn to Wakefield, 41 Fairmount Ave.
- Cunningham, Thomas D., Denver, Colo., now 1522 Lafayette St.
- Dunbar, Francis H., Mansfield, Boston, office now 416 Huntington Ave.
- Dunham, Henry B., from Belleville to Verona, N. J., Essex Mountain Sanatorium.
- Dunn, William A., Boston, from 154 Richmond St. to 39 Somerset St.
- Ellis, Frederic Warren, from Monson (Hampden) to Newton Centre (Middlesex South), 1175 Center St.
- Ernst, Harold Clarence, died at Plymouth, September 7, 1922, aged 66.
- Fitzgerald, John Joseph, Haverhill, now 83 Emerson St.
- Fremont-Smith, Frank, Jr., from Roxbury (Norfolk) to Boston (Suffolk), 265 Beacon St.
- Granger, Frank B., from Boston (Suffolk) to Allston (Middlesex South), office Boston, 520 Beacon St.
- Greene, Ransom A., from Boston (Suffolk) to Taunton (Bristol North), Taunton State Hospital.
- Greenwood, Allen, Wellesley Hills, office Boston, now 82 Commonwealth Ave.
- Howard, Margaret E. P., Reading, 122 Summer St.
- Howe, Joseph D., Pittsfield, office now 409 Berkshire Life Bldg.
- Keenan, Herbert John, died at South Boston, September 7, 1922, aged 51.
- Kleinert, Margaret Noyes, now Boston, 82 Commonwealth Ave.
- Koppel, William, Boston, from 82 E. Concord St. to 24 Hancock St.
- Korb, Harry, from Roxbury (Norfolk) to New York City (non-resident), U. S. Coastguard Cutter Seneca.
- Levine, Samuel A., Brookline, office now Boston, 270 Commonwealth Ave.
- Liebman, William, from Hartford, Conn., to Brookline, office Boston, 636 Beacon St.
- Little, Abby Noyes, from Syria to Newburyport, 22 Essex St.
- Looney, Joseph M., from Somerville (Middlesex South) to Towson, Md., Sheppard & Enoch Pratt Hospital (non-resident list).
- Parker, Frederick D., from Brookline (Norfolk) to Chelsea (Suffolk), Soldiers' Home.
- Perkins, Franklin H., from Wrentham (Norfolk) to Newton (Middlesex South), 16 Summit St.
- Prenn, Joseph, from Worcester (Worcester) to Brookline (Norfolk), office Boston, 536 Commonwealth Ave.
- Reid, William D., Boston, now 270 Commonwealth Ave.
- Reynolds, Henry Vose, died at Brookline, September 21, 1922, aged 61.
- St. Marie, Philippe, Pittsfield, office now 312 North St.
- Sever, James Warren, Cambridge, office Boston, now 321 Dartmouth St.
- Shattuck, George B., Boston, from 188 to 68 Beacon St.
- Slattery, John Richard, died at Auburndale September 11, 1922, aged 55.
- Sprague, Russell Bradford, from Suffolk to Barnstable, Yarmouthport, Medical Director Cape Cod Health Bureau.
- Story, Theodore L., from Allston to Brighton, 141 Sutherland Road.
- Taylor, Erwin H., Pittsfield, office now Agricultural Bank Annex.
- Thomes, John B., Pittsfield, office now 18 Bank Row.
- Townsend, Charles W., Boston, now 98 Pinckney St.
- Walker, Waldo W., West Somerville, office Boston, now 270 Commonwealth Ave.
- Webber, Wolfert G., from Brookline (Norfolk) to Newton Highlands (Middlesex South), office Boston, 546 State House.
- Weinburg, Philip B., Brockton, now 37 West Elm St.
- Weissman, Ruth, from Roxbury to Dorchester, 1027 Blue Hill Avenue.
- Woodward, William C., from Brighton to Chicago, Ill., 1535 E. 60th St.

Changes of address should be sent to the Secretary, Dr. Walter L. Burrage, 42 Eliot Street, Jamaica Plain.

Correspondence.

THE TREATMENT OF TUBERCULOSIS.

Mr. Editor:

A prominent physician has written lately that he has "no confidence whatever in any drug treatment of tuberculosis except for the relief of symptoms."

This, to me, is a regrettable statement, and one with which I am not in accord. I am confident, now more than ever, that heshwood creosote treatment, properly given, by the mouth and by inhalation, is curative.

The great difficulty today with many practitioners, is that they do not attend sufficiently, in medication, to facts, which may appear of small importance and yet are often primary. It is essential always, with our most efficient remedies, that they should be given with care and intelligence, back up with experience and, maybe, repeated trial. Creosote has been wrongly given in very many cases. The dose was often too large and not suitably combined. In the majority of cases, it should only be given in relatively small doses, repeated more or less frequently and continued a long while, with occasional interruptions.

If inhalations of creosote are used, they also should be given with much care and attention to little details. Without these, they are not really useful and frequently given up because of the lack of knowledge on the part of the physician. The patient, if improperly directed and guided, will very soon lose faith in the remedy, become discouraged and abandon a very useful treatment, when it is properly carried out. To those who wish to know my views, corroborated by wide experience, I refer them to *Medical Record*, Feb. 27, 1922, and especially to *Medical Record*, Jan. 24, 1920, where they will find not a little that is worth while about "The inhalation treatment in pulmonary tuberculosis."

BEVERLEY ROBINSON, M.D. New York.

"The Boston Medical and Surgical Journal, Sept. 28, 1922, page 400.

CHRISTUS MEDICUS.

Onset, Mass., Sept. 30, 1922.

Mr. Editor:

Your editorial (Sept. 28, p. 485, "The Practice of Medicine by the Clergy") seems to refer to a recent revival, by a Christian Sect, of what the Church Universal tried thoroughly long ago and abandoned as not within the scope of any powers granted to it. Cumulative evidence of this former practice is given by a late discovery of the earliest inscription yet found invoking Christus Medicus. This came to light in a second Pompeii as to preservation, viz.: in Timgad in Algeria south of Constantine. This city was one of the wonderful African copies of Rome which the French (and the Italians also) have been exploring and describing. This inscription (of about 350 A.D.) is fully explained in a report printed in the *Comptes Rendus de l'Académie des Inscriptions et Belles Lettres de l'Institut de France*, for 1921; citation I unfortunately cannot give, being convalescent from glaucoma—operations and away from books and my notes. Christ was then regarded as a healer of physical and psychic ills, evidence of which can be found also in the writings of the African Church-Fathers which are late enough to be familiar to the above mentioned sect which is known to be little interested in more primitive Christianity. My intended article on the whole subject must be postponed indefinitely, and this letter is merely to call attention to the above report, which can be found in any great library and which will give enough for any ordinary inquirer.

(MR.) ALFRED ELA.

NOTICE.

The Suffolk District meeting, Oct. 18th, is open to all physicians who would like to hear Dr. John O. Polak, Professor of Obstetrics and Gynecology, Long Island College Hospital.

SOCIETY MEETINGS.

DISTRICT SOCIETIES.

A list of society meetings is herewith published. This list will be changed on information furnished by the secretaries of the societies, and will appear in each issue.

Barnstable District:—Hyannis.—November 3, 1922, February 2, 1923, (Annual Meeting).—May 4, 1923.

Bristol North, Bristol South, Barnstable and Plymouth Districts will hold joint meetings sometime this fall.

Bristol South District:—Fall River.—November 2, 1922, May 3, 1923.

Essex North District:—Haverhill, (Semi-Annual Meeting).—Jan. 3, 1923. Y. M. C. A. Building, Lawrence, (Annual Meeting).—May 2, 1923.

Essex North, Essex South, Middlesex North and Middlesex South Districts will hold joint meetings October 18. Place undecided.

Hampden Districts:—With Hampshire District in Holyoke. Regular meeting in October.

Suffolk District:—Stated Meeting, October 18, 1922. Combined meeting of Boston Medical Library and Suffolk District, November 22, 1922; December 27, 1922; January 31, 1923; February 28, 1923; March 28, 1923; Annual Meeting, April 25, 1923.

The Springfield Association of Medicine meets the second Tuesday of each month. Schedule of speakers includes the following names: Dr. Alexis Carrel, Dr. W. B. Long, Dr. J. W. Williams, Dr. W. S. Thayer, and Dr. Barton Cooke, Hist. The date for each speaker has not been assigned.

Middlesex North District:—Meetings Wednesday, October 25, 1922; Wednesday, January 31, 1923.

Worcester District:—Union Meeting with the Worcester North District in Fitchburg, Oct. 24.

Worcester District meetings in Worcester, Nov. 8, Dec. 13, 1922, Jan. 10, Feb. 14, March 14, April 11 and May 9, 1923, the last named date being the annual meeting.

The four Western Districts will hold a joint-meeting at the Hotel Kimball in Springfield on Oct. 19, 1922.

STATE, INTERSTATE AND NATIONAL SOCIETIES.

Plans are being made for a joint meeting of the Worcester and Worcester North Districts in October.

The Fifty-First Annual Meeting of the American Public Health Association will be held at Cleveland, Ohio, October 16-19, 1922. Headquarters will be at Hotel Statler.

The American Association of Oral and Plastic Surgeons will hold their annual meeting at the Medical Library, Boston, on October 20th and 21st.

Clinical Congress of the American College of Surgeons will be held in Boston, Mass., on October 23-27, 1922, Franklin H. Martin, Chicago, Director-General.

Massachusetts Association of Boards of Health, October 26, 1922, Worcester, Mass., W. H. Allen, Mansfield, Mass., Secretary.

New York and New England Association Railway Surgeons, 32nd Annual Meeting at New York City, October 28, 1922, Donald Guthrie, Sayre, Pa., Secretary.

November, 1922. Massachusetts Society of Examining Physicians, (Date and place of meeting undecided), Hilbert F. Day, Secretary. National Cancer Week, November 12 to 18.

December, 1922. New England Dermatological Society Meeting, Wednesday, December 13, 1922, at 3:30 p.m., in the Surgical Amphitheatre, Boston City Hospital, C. Guy Lane, Secretary.

January, 1923. Massachusetts Society of Examining Physicians, (Date and place undecided), Hilbert F. Day, Secretary. Massachusetts Association of Boards of Health, January 25, Annual Meeting, Boston, W. H. Allen, Mansfield, Mass., Secretary.

February, 1923. New England Dermatological Society Meeting, February 14, 1923, at 3:30 p.m., in the Skin Out-Patient Department, Massachusetts General Hospital, C. Guy Lane, Secretary.

March, 1923. Massachusetts Society of Examining Physicians, (Date and place undecided), Hilbert F. Day, Secretary.

April, 1923. New England Dermatological Society Meeting, April 11, 1923, at 3:30 p.m., in the Surgical Amphitheatre, Boston City Hospital, C. Guy Lane, Secretary. Massachusetts Association of Boards of Health, April 26, 1923, Boston, W. H. Allen, Mansfield, Mass., Secretary.

May, 1923. Massachusetts Society of Examining Physicians, (Date and place undecided). American Pediatric Society Meeting, May 31, June 1 and 2, 1923, at French Lick Springs Hotel, French Lick, Ind., H. C. Carpenter, Secretary.

June, 1923. American Medical Association, San Francisco, June 25-29, 1923, Alexander R. Craig, Chicago, Ill., Secretary.

July, 1923. Massachusetts Association of Boards of Health, July 26, Nantasket, W. H. Allen, Mansfield, Mass., Secretary.

*Deceased Sept. 2, 1922.